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BRIEFLY TOLD.

DEATH OF GENERAL JAMES JOURDAN.—We regret to have to report the death of General James Jourdan, President of the Brooklyn Union Gas Company, who passed away at his home, 174 Washington Park, Brooklyn, N. Y., the evening of the 1st inst. The funeral services were held at his late home, the afternoon of the 4th. Deceased was in his 79th year. We have in preparation an account of his life's work.

ASKS THE PUBLIC SERVICE COMMISSION TO NAME THE RATE.—It may have been that the attitude of the Public Service Commission (both Districts) of the State of New York has been such, since the very beginning for active work of the body, as to cause confidence in its fairness, or that its findings have been of the kind that compel those concerned to silence, in the fear that further contention would lead to vexatious, long drawn out court proceedings. In either event, or whatever the cause, it is certainly true that in the last two years the lawyers have earned fewer fees from the treasurers of the gas companies of this State than any other two years in their respective histories will show. The greatest feature, however, and undoubtedly one that will justify, from the gas maker's standpoint, the at best irksome supervision of a public body, is the guarantee that this supervision removes, in good degree, the industry from the assaults of the free lances, usually chosen "to represent the people," as aldermen, councilmen, supervisors, or by whatever other term those may be designated. After a fairly lengthy trial of commission-supervision, it may not be really claimed that our experience therewith has been such as to lead one to wish that this supervisional method be discontinued. Calmness, fairness and studiousness have certainly marked the Commission's hearings in this State, and the rulings have been quite well within commonsense and fairness, despite the fact that in a degree in several instances, and to the full in one instance, the Commissioners, by deciding in a contrary way, could have listened to much applauding of the clap-trap sort. Indeed, from the experience so far gained, one might be forgiven for expressing the thought that 'tis a pity the Commission plan is not older than it is. While we well know that the feeling in the industry in respect of this nature of government was growing in its favor from day to day, we must nevertheless say we are far from being prepared to actually know that this favor had gone on from leaps to bounds; but the record actually proves it, as the following plain statement will attest. A short while ago several residents of the Borough of Queens, which adjoins Brooklyn Borough directly on the southeast section of Long Island (a section the population of which, through improved facilities for transportation, is multiplying in really marvellous way), petitioned the Commissioners for the District that a reduction in the rates charged for gas and electric currents be ordered—the district is supplied by the Queens Borough Gas and Electric Company, with headquarters in Far Rockaway, or Rockaway Park. The district was for years, and is to-day, for that matter, known as a watering place, visited in the summer by hundreds of thousands, but quite desolate in winter time; that is, desolate in the sense of a vastly cut down population. However, it is not the history of the locality that is altogether germane to the subject now. Enough, therefore, be it to say on such account, its desolateness in the winter time vanishes as the travel facilities on better account are manifest. The agitators for lower prices persisted in their wigging of the Commission, and the latter had virtually taken the preliminary steps toward an investigation, when now, to the amazment of the complainers and to the astonishment of those in the gas trade of the Southern Section of New York, the proprietors of the Queens Borough Gas and Electric Company appeared before the Commissioners asking them to name rates for both gas and electric current supply that they shall deem just to all concerned. The malcontents are of a verity dazed by this action, and the cheap adventist politicians who sought to at least have their names well emblazoned in the local public prints, during the testimony taking times, will cut at best only small figures, principally of the oblong, hollow (or zero) order in the transactions. The charge for gas looks exceedingly reasonable, in that it will average perhaps $1.25 per 1,000 cubic feet, whereas that for electric current will likely average 11½ cents per kw. hour. However, the main point to be considered and thought-out is that the Company put all its eggs in the Commissioners' basket, seemingly content in the certainty that the basket will be carefully handled. Peering into the what-might-

have-been regions, the writer is led to remark, would this step have been taken were the Sharp interests in Far Rockaway as prominent as these once were? However, this example from initiative through referendum, to *sub judice* and *finis* will be watched with interest.

PROGRESS REPORT, THE GAS EXHIBITION, BOSTON.—The gentlemen in charge of the preliminaries for the Sixth Annual Convention of the National Commercial Gas Association are assuredly of the sort who do not find it necessary, for the completion of things on hand, to leave the details of such completion until the last moment, at which impressive period other less methodical managers suddenly awake only to learn, in forcible fashion, that that which should have been done yesterday was put over until —— ——? Then, fully awake to the backwardness of matters which they were presumed to initiate and supervise, a most nerve-wrecking display of executive ability is rushed to the fore, and the subordinates are brought to task—useful scapegoats for their superiors. No, the "men higher up" in the National Commercial's plannings have neglected not a thing that should have been heard, seen or done in connection thus far with the Association's sixth meeting. The Chairman of the Exhibition Committee (Mr. R. C. Ware) and his associates seem to us to have had the hardest task to handle in connection with this proceeding, for their results at the outset must necessarily have been of the slimmest, tentative sort; but here they are, quite abreast with the other committees in the handling of their task. To show that this is not averring too much, we herewith quote from a notification to us, under date of the 4th inst., regarding the plane on which advances are being made:

The Boston gas show is now assured of a most complete and interesting representation in every branch of the gas industry. The list of exhibitors covers all parts of the country, and includes a number of firms which have hitherto not exhibited in the exhibitions of the National Commercial Gas Association. The tasks of preparing booths and decorations and the spreading of piping are progressing rapidly, and it surely is within the line of truth to say that the decorative effect will be unusually pleasing. In fact, members of the gas industry will be so well repaid for making inspection of the illumination, that alone it would be worth travelling far to see. A particular feature from the exhibition standpoint will be music, which is to be furnished by the "Fadettes Orchestra," of Boston, a very well known and popular organization, which undoubtedly will form an exceptionally good drawing card. It has been planned also to have a series of demonstration lectures which will, of course, be of particular interest to the ladies. Another most interesting feature will be an operating exhibit showing the complete process of mantle manufacture, which will form part of the Welsbach Company's display, and it must prove of value to gas users and gas maker alike. The membership of the National Commercial Gas Association is growing very rapidly, and it is thought that the number on the rolls will be in the neighborhood of 3,000 by the time of the Convention. Preparations are being made for an attendance in Boston of 1,500 gas men. There is, therefore, from every point of view, the brightest indication of a record breaking convention, and of the most complete and interesting "Gas Show" yet held.

CURRENT MENTION—

THE latest in "Instruction Pamphlets" is from the press of that justly famous meter making house of Helme & McIlhenny, of Philadelphia. They are before the industry with a well-compiled 4-page circular or pamphlet, which has for its title, "The True Gas Meter," and which carries a well-digested volume of description, that never in tone or application goes above the mind or thought scope of the average meter user—which plainness of statement is necessary when one remembers that not all—no, not nearly all—meter users are as familiar with rhetoric or oratory or levers or fulcrums as they might or could be. The language of the circular is to the point, and the point of the publishers is the free circulation of the pamphlet amongst gas users by gas companies. The mere cost of paper and printing in connection with the pamphlet is $3.50 per 1,000, and Messrs. Helme & McIlhenny announce that they will be pleased to send the pamphlet in such multiples of 1,000 as purchasers are inclined to order.

THE franchise recently granted for the supply of gas to the residents of the famous Rumson borough of New Jersey, has an odd set of royalty paragraphs proviso, the substance of which is that: After the first 5 years any increase in business shall be followed by a proportionate increase in the percentage of franchise tax. For instance, if in the sixth year of the franchise the business shows a 10 per cent. increase over the business of the fifth year, the franchise return is to be increased 10 per cent. Should it show a further increase of 10 per cent. in the seventh year, the franchise payment is to be increased 20 per cent., and in like augmentation until the maximum base percentage reaches 5.

MR. KENNETH SEAVER has been appointed Chief Engineer to the Harbison-Walker Refractories Company, which looks good for both master and man.

WE are in receipt of "Bulletin" No. 141, amongst a number of others recently issued by the Bristol Company, which shows a 6-inch chart, new model of the Company's well-known pressure gauges.

"MR. WILLIAM M. FARROW, New Business Manager of the Cambridge (Mass.) Gas Light Company, recently completed one of the finest examples of outside lighting in New England. The scene is on the grounds of Tufts' College, Medford, which are now illuminated nights with Humphrey outside arcs. This plant displaced hundreds of incandescent electric lamps. Mr. Farrow has also designed a very effective gas display sign, which is as useful as any electric display of this sort that I ever saw, and I've seen many. Remember, I merely mention effectiveness, without any reference whatever to the marked economy gained.—L. D."

MR. JOHN J. GARRISON, Manager of the Rathbone-Sard Company, of Albany, N. Y., informs us that Mr. Edward C. Lovett has joined the forces of the Company, in the position of Assistant Manager of the Company's gas stove division, Aurora, Ills. Mr. Lovett is certainly an up to-date chap, and we wish him all possible good fortune.

LAST month an important decision, which must have consuming interest for corporations whose pipes have suffered from electrolytic wearing through the negligent control of other companies operating street railway systems, was handed down last October, by Judge Sanborn, sitting in the United States Circuit Court, for the district in which Peoria, Ills., is located. The suit was that instituted by the proprietors of the Peoria Water Works Company against the Peoria Railway Company. In this judicial inquiry, which was instituted early in 1908, and during which the case was twice referred to Referee Frank L. Weam to take expert testimony, is virtually terminated, by Judge Sanborn's recent decision, in which he makes permanent an injunction against the street car company, restraining it from so permitting electric currents generated by it from "wandering" in such paths as to cause damage to mains or other property of complainant by electrolysis. In the carrying on of the inquiry over 100 well-known engineers and experts were examined, and much interesting testimony was presented. We understand that this is the first positive decision rendered in premises of this nature, and we hope to publish it in full when the complete transcript of the case is compiled.

"B. D. M.," writing from Des Moines, Ia., under date of the 6th inst., says: "I did not see any particular reference in the JOURNAL to the payment on royalty account made by the Citizens Gas and Electric Company, of Council Bluffs, Ia., to the city treasury, so I send this statement, thinking likely the matter had escaped your attention: "The Company paid to the city authorities (the check was forwarded about mid-October) $4,728 in royalties on the business done by it during the past year. This payment is, to all intent and purpose, 15 per cent. larger than the amount paid on similar account by the Company in 1909, and accordingly represents a good increase in the Company's general business. It pays 3 per cent. on the gross receipts for power furnished for electric lighting and 2 cents per 1,000 cubic feet on all gas consumed and sold. The contract which the Company has with the city for the payment of this royalty has another year to run. The price charged consumers for gas by this Company, which has a practical monopoly of the business, is $1.35 per 1,000 cubic feet, with a rebate of 10 per cent. if bills are paid by the 15th of the month."

"B. S. G.," is informed that during the hearing now going on before the Public Service Commission, Second New York District, which has to do with advance deposits by consumers, to in a measure guarantee the payment of gas accounts, the main features of the requirements proposed for adoption are: "Interest at the rate of 6 per cent. per annum shall be allowed on all deposits and shall be paid annually; provides the specific manner in which the companies shall keep a record of each deposit; prescribes the form of receipt that shall be used, upon the reverse side of which is to be printed for the information of the consumer the terms and conditions upon which the deposit is exacted, and may be withdrawn, and it requires each company not only to use these receipts but to substitute them for the receipts now outstanding."

Filling New Gasholders.

By Mr. J. H. Boughton, M.E.

The usual method of filling new gasholders, by simply expelling the air in the container through a hole in the crown, by blowing in a strong supply of gas, is not altogether safe or satisfactory. Under this method, the gas being lighter than the air, blows out readily through the top of the crown; but, even after considerable time, a high percentage of air still remains near the surface of the water and at points remote from the opening in the crown. Frequently a highly explosive mixture remains which only has to be fired to do great damage.

A greatly improved method, which introduces very little added expense, is to insert a 3 or 4-inch pipe in the hole in the crown, adjusting its lower end to a point about 2 inches above the surface of the water. If gas is then blown through, the air, which remains at the bottom along the water, will be expelled first, and soon after gas is detected at the opening it may be assumed with safety that the air has been thoroughly expelled. The opening in the crown may then be closed, leaving the riser pipe in position for future use, or removing it as may be more convenient.

Municipal Inspection of Gas and Gas Meters.

[Prepared for the 18th Meeting of the Pacific Coast Gas Association, by Mr. William Schade, City Gas and Meter Inspector, Los Angeles.]

Mr. President and Members of the Pacific Coast Gas Association: Municipal inspection of gas and gas meters is by no means of recent date, neither is it an imposition upon gas men nor an infringement upon their rights to conduct their own business to suit themselves, as many have and perhaps now supposed it to be. Municipal inspection is as old as the gas business itself and a natural adjunct to the business.

In order to make myself clear and substantiate my position, I beg your kind indulgence in a brief review of the early history of the gas business. I sincerely believe there are many gas men now, perhaps members of this Association, who are not familiar with the early struggles for the introduction of artificial gas as a commodity or public utility, and it may, therefore, be of interest to them.

England is undoubtedly the mother country of the discovery and practical application of artificial gas as a public utility, as well as to the regulation of prices for gas and the quality thereof. Nearly two centuries ago illuminating gas was first artificially distilled from coal in heated iron retorts, and the gas thus obtained was called "Spirit of Coal," but was never put to a practical use there (notwithstanding that a number of men experimented continuously with this process for about 75 years) until the close of the eighteenth century, when Mr. William Murdoch lighted his own house, at Redruth, in Cornwall, with coal gas. Coeval with Mr. Murdoch's experiments were those of M. Lebon, in France, who both lighted and heated his own house by this means, and also made his first exhibition of public practical application of this great discovery; and, through the untiring efforts of Mr. F. A. Winsor, one-half of Pall Mall, London, was lighted by gas in 1807.

The great advantage of gas lights for streets and public buildings became apparent, and in the year 1809, Parliament was appealed to for an act granting permission to incorporate a gas company, which was granted the following year. From the foregoing statements it will be seen that, as early as 1809, federal aid was enlisted by those who intended to enter the business of manufacturing and distributing gas for public use, which subsequent events proved to be a wise move; and, while in consequence of this act many gas companies sprang into existence, frequently in such keen competition with each other that some of them almost went under, which was not to be wondered at, taking into consideration the absolute inexperience and the crude method of production as well as distribution. As late as 1850 some companies' shares, valued at $250 each, could not be sold for more than $6.25. The outlook was indeed gloomy for some of these companies. Parliament was again appealed to, and, under the pressure brought to bear upon the gas companies by this legislative body, amalgamation of many companies, as well as districting of territory, was speedily effected, which received the sanction of Parliament in 1860. From this time on the use of gas as a commodity spread rapidly all over England, France, Germany and the United States of America.

Simultaneously with the assistance given the gas companies, and the establishment of a fixed rate per 1,000 cubic feet of gas, guaranteeing a 10 per cent. profit on the investment, besides a suitable reserve, Parliament realized at once the necessity of also protecting the rights of the people, which it did without delay by creating a commission, to be appointed by the Board of Trade, whose duty it was to see that justice and equity prevailed between producers and consumers, concerning the rates to be charged for gas, and whenever the books of the companies showed an earning in excess of the guaranteed 10 per cent. and a suitable reserve, the rate per 1,000 feet was reduced; and so admirably did it work that, in the course of 12 years, the price of gas had been reduced from $3.75 to 93 cents per 1,000 feet. Parliament also appointed at the same time three Gas Referees (expert chemists), whose duty it was to make daily tests of the gas produced, to determine that the established standard of the illuminating candle power and purity was maintained and strictly adhered to. The necessity for creating the position of municipal inspector arose principally from the fact that the effect of inhaling the impurities, and the offensive odor accompanying the combustion of gas in the homes of the people, were so objectionable as to greatly retard the introduction of gas. The science of chemistry of gas manufacture and purification was then in its infancy. It became imperative, therefore, that competent men should be placed in charge, independent of the companies, to see that the people received honest value for the honest dollar the government had asked them to pay the companies. This was not derogatory to the interests of the companies by any means, but the natural sequel of the then existing conditions, a decided advantage to all concerned and the only proper thing to be done. On the one hand, it saved the companies the employment of a chemist, the installing of a costly laboratory, while they knew at all times the exact condition of their gas. On the other hand, the people felt more secure in having their interests officially taken care of. This was soon recognized wherever gas was used and municipal inspection became universal in England. Birmingham, Manchester and other large cities adopted rules and regulations as early as 1864.

Now, Mr. President, I do not wish to be misunderstood concerning the last two statements. I am highly in favor and heartily recommend that every first-class gas plant should have a laboratory, with a competent man in charge of it, and every gas manufacturer should urge in his respective community (for his own benefit if nothing else) the creation of the position of municipal gas and meter inspector. Not only can you check up the work of your own man with him, but you can also unload any amount of complaints upon his shoulders without cost, and the result is usually very satisfactory. Speaking from experience I believe it will receive the indorsement of all the representative men of the three companies operating in Los Angeles. I wish to state right here, Mr. President, that municipal inspection of gas and meters is absolutely sane and logical and the proper thing to have, for the results are as far-reaching in their benefits to the companies as they are for the public, and any man thinking otherwise should change his mind at once. In every well regulated, civilized country everybody expects either Federal, State or municipal inspection of every public commodity and we should encourage it here. This, I think, will be sufficient on the municipal inspection of gas, and I will now take up the other part of the subject, "Municipal Inspection of the Gas Meter."

Mr. President, had I the tongues of men and of angels, or the gift of speech of the greatest orators the world ever knew, I would not dare to attempt to adequately describe the flow of language (profane and otherwise, mostly profane), the engendered feelings of hatred and passion, that this little innocent, inoffensive thing, "this outward monitor" of man's inward passion is guilty of, this bone of contention, this bugaboo of all the bugaboos in the gas business, this "perpetual" motion machine, which, according to public opinion, fills the coffers of the gas man, obeying the will of its master, jumping up-and-down according to his needs and wants financially, and the amount the public can stand, this best and most faithful friend the consumer ever had, never affected by the misreadings of the man who reads it, never trying to wreak vengeance for the abuse it suffers. Now it is exposed to the glaring, burning sun by day and the cold and chilling dampness of the night, again it is tossed about under some shack, sunk half-way down into mud and slush; then, again, it is exposed to the sprinkling of the garden hose and made a target for stones thrown by mischievous neighborhood boys, and so forth and so forth; never occupying a decent place in the house of the consumer as it should, yet it is ever faithful, ever true; but because people do not know or understand the construction or operation of a gas meter they express their erroneous ideas according to their feelings. It is essential, therefore, that somebody should educate the

people on the gas meter and the testing of it when necessary, and what would be more proper than having a municipal inspector for this purpose?

In conclusion, I beg to say that, being conscious of the fact that however interesting, a paper may be too long, and thus become tedious, totally defeating the intention of the writer. I made but a brief reference to the history of gas lighting, as many of you have no doubt discovered. But there was Von Helmont, the earliest experimenter in our business, and who first called his discovery "Gheist" (Ghost), or as I have translated it "Spirit of Coal"—hence our word "Gas." Samuel Clegg, called by many "The Father of Gas Making," and to whose inventions of various apparatus (many of which are used to this day), among which is the gas meter almost as we have it now, we are greatly indebted, and many others you no doubt know of. In connection with this subject it may be permissible to remind you of the earliest successful American governmental gas inspection, viz., by the Board of Gas and Electric Light Commissioners of Massachusetts. The beneficent results of the labors of that Commission have been so much appreciated by the people and by the corporations alike that at last it has caused the institution of similar bodies in other States. Thus I trust I have made good the main points as set forth in the title of this paper.

And now, Mr. President, let us draw the curtain. And, gentlemen, if you have no other reason for supporting and urging municipal inspection of gas and meters everywhere, do it for the meter's sake, for if you don't, every meter you put out may become a nail in your coffin, metaphorically speaking.

Central Station Illuminating Engineering Department Work and Methods Applied by the Denver Gas and Electric Company.

[Prepared by Mr. C. F. Oehlmann, Denver, Col., for the Fourth Annual Convention, Illuminating Engineering Society.]

The illuminating engineering department of the Denver Gas and Electric Company consists of an illuminating engineer and his assistant. The illuminating engineer specifies the amount of illumination, number of openings or units, and style of lighting, deciding whether it shall be gas or electric, and the kind of either, and meets and advises with all consumers. The assistant does all architectural drafting, fixture designing, writes all wiring specifications, and makes and keeps all records pertaining to the various consumers, their wants and complaints.

This department has an office where architects may come for information, contractors to estimate jobs and consumers to discuss store or residence lighting, for better and more satisfactory illumination. In this office are samples of the various kinds of lamps, both gas and electric, as well as burners, shades and reflectors. These lamps and shades are not connected for service, nor is it intended to make a demonstration of what any one lamp will do, but they are simply used to explain to consumers why lamps, shades, etc., are built as they are, to explain why a tungsten lamp must be handled carefully, why a gas mantle is to be protected from rough usage, why some reflectors are more efficient than others, why a shade is necessary at all, and also to explain a few processes of the manufacture of the various lighting instruments. Everyone is interested; even explaining where the candle power is measured from on a 16-candle power carbon lamp excites much interest, and 9 out of 10 consumers seem surprised that 16-candle power does not mean 16-candle power, end-on.

There are a great many such little demonstrations that are so easily shown consumers, and create so great an impression, that the above method has been found better than requiring a consumer to look into a set of booths showing comparison of good and bad illumination.

Existing conditions on the street are far better demonstrations than a set of rooms or booths built and lighted under ideal conditions. It is much easier to have a consumer visit a certain store to view the system used and allow him to draw a comparison; often a new idea is worked out on the sidewalk that gives a pleasing originality to the scheme of illumination when completed. If there were ideal conditions in each store, residence, etc., then a set of model rooms illuminated properly would be most valuable. In actual work ideal conditions are not known; they have been heard of from time to time, but yet there is not in Denver an ideal condition, from a scientific illumination standpoint. For instance, if the style of building or structure is Gothic, one would not divide a ceiling into bays and show a great number of outlets or units. This condition is true of most styles of architecture, such as the Queen Anne, Classic, Greek, Renaissance, Roman, etc. So, no matter what would seem scientific in illumination, or what is desired most, one must sacrifice for the "sake of art" and cut according to the cloth at hand. This result holds true, even more so in residences, churches, cathedrals, public halls, libraries, etc., and in just such places as these it is easier to blunder in designing the scheme of illumination and fixtures than in any other kind of a commercial work.

There are more severe criticisms and grief from inconsistent fixture designing, where some particular style of architectural design has been adhered to, than in any other work of the illuminating engineering department. It is known that there are three very decided purposes which characterize the three most distinct branches of the art of illumination, namely:

1. That of supplying light for carrying on such adventures or amusements as are extended into hours of semi or whole darkness. This branch includes interior illumination, such as store, residence, factories and shops.

2. The art of scenic illumination directed for special effect and designed to produce special illusions. This branch includes stage lighting, picture and art galleries, etc.

3. That used for what is called electrical advertising, impressive, attractive, establishing locations, etc. This branch includes window lighting, sign lighting, electrical lamp creations, such as growing flowers, illustrations of lightning, rain, fountains, etc. Each of the above has distinct purposes and demands special attention and methods.

Keeping the above branches of illumination in mind, it will be seen that there are three essential points involved, namely: The right quantity, right quality, and the right use. Moreover there is another set of three factors, namely, the station or manufacturing end of the gas and electric business; the customer or buyer and the commercial department; or that department that must sell the output of the manufacturer and so sell it that the consumer will not be abused and will remain a consumer for not only a few months, but for a number of years and be satisfied and enthusiastic over the use of the commodity. There are thus three purposes, three principles, and three principals.

There have been too many papers placed before this convention to be read and discussed for the present author to attempt to interest the members even for only a few moments in the purposes or principles. However, it may be wefl to discuss the principals, telling of the methods employed at Denver, in the hope of obtaining some suggestions that will improve the methods in many ways.

The illuminating engineering department of a central station is engaged in a work different from that of the consulting engineer, or that of the laboratory engineer. The consulting engineer is an authority in lamps, shades, effects and results. The laboratory engineer is all of this and, in addition, is the inventor for the consulting engineer. The illuminating engineer for the central station must try, when advisable, to put into application all of the ideas of the former and the inventions of the latter, and even this is the easiest part of the work. The consulting engineers are arranging from time to time formulas for figuring densities of illumination that simplify the work of the artist as he drafts plans and specifications for a proposed lighting installation.

The laboratory engineers in the last 20 years have made two great strides in better gas lighting; one stride is the incandescent gas mantle, the other the inverted styles of mantle lamp. The advancement in electric lighting has been much more rapid, the arc, carbon, improved carbon, tantalum and tungsten lamps following each other so rapidly that one does not even now feel safe in designing a lighting system that should last at least 3 years. There are, then, the consulting engineer with his formulas and opinions, and the laboratory engineer with the inventions.

Though these two classes of illuminating engineers have done wonderfully good work, they have been, up to the last year or so, of very little help to the central station and the consumer jointly. The consumer and the station must be in harmony. The central stations have realized this fact, and while knowing that the consulting and laboratory engineers have done a great deal of educational work among people interested in the sale and manufacture of gas and electric appliances, the consumers at large have learned very little. The central stations acknowledge this fact and have found that the best method of getting good results quickly from illuminating engineering work is to reorganize and operate an illuminating engineering department in connection with the station. The central station illuminating engineer, after having studied the science of illuminating

engineering work, learns that his work is to "hold the business." The result is that the illuminating engineering department finds that it must sell to the same consumer light for as many hours out of the 24 as possible, in order to widen the peak load, and that to the same consumer light must be sold for as many years as possible. Thus the peak should be widened until there is no peak, and the station investment, covering mains, services, meters, etc., should be kept in actual use during the approximate life of the station installation.

A person contemplating installing a gas or electric plant expects the plant to operate at least 20 years. No one will deny that it is better to conduct a good business continuously for a number of years with one consumer than to make investments of service, main and meter, in order to hold an excess of business for a month or two, and then have the consumer complain of the high bill and order the meter removed and the account closed. This is a common occurrence; in fact, 70 per cent. of the illuminating engineering department's work is in the straightening out of just such bungles. It is well known that the ideal load curve is one that shows no peak—it is also well known that such a load curve is almost an impossibility; there is sure to be a peak one slope of which occurs between dusk and dawn. The study of the load curve is of great interest to the illuminating engineering department.

Business.—There are several classes of business to be sought and even fought for. One of the best is the street lighting contract, which usually covers both the maximum hours between dusk and dawn and also covers a majority of years of the life of the plant. Another is the all-night service for advertising purposes, such as window lighting, sign lighting and billboard illumination. Another is for light over the safe in the rear of stores, etc. Another is for small lamps at the base of show windows in winter months, for the purpose of preventing the formation of frost and moisture on the windows. Another is for porch lighting on an all-night arrangement. For those customers who will not accept the all-night rate, one can usually establish a 2 o'clock rate; this plan can be carried out by means of extension keys or other devices so arranged that patrolmen can turn on or off gas from the outside of the building. Then there is the popular midnight lighting rate, frequently used to good advantage. There is the cluster gas lamp or electric arc lamp for all-night use at livery stable entrances, garage entrances, dairy stables, hospitals and any other place where wagons or vehicles leave and approach at various different hours of the night. Park lighting is another good business to secure. There are also other uses for illumination at all hours of the night that might be given some thought.

Complaints.—As was mentioned in an earlier part of this paper, 70 per cent. of the work of the central station illuminating engineering department is the settling of complaints of some kind or other, usually high bills. These complaints come from all departments of the company. When a complaint comes to the illuminating engineering department, the illuminating engineer tags it, "Hold the business." It is the complaining consumer that is the encouraging prospective consumer for the gasoline salesman. Not many gasoline lamps would be in service to-day if all gas or electric consumers had always been pleased with and enthusiastic over the results of using either gas or electric light. The person complaining may be what is sometimes called a chronic kicker, and by some departments considered incurable; but there are few chronic kickers in the Denver territory. The complaining person is one who usually complains about a high bill, or poor service, or both. The first step taken is to ascertain what amount the consumer has been paying during the past year. This information is marked on the complaint memorandum for future reference; the person who turned in the complaint for the consumer is consulted and much useful information is thus obtained. A call is then made on the consumer by a member of the illuminating engineering department, who discusses with him the reasons for his complaint. He is offered the services of the illuminating engineering department free of cost. It is explained to him that if he accepts the services of the department his place of business will be measured and a drawiug of his store for illustrating a suggestion or a new system of illumination will be made.

Usually in the case of so-called high bill, and often in the case of extremely poor lighting service, the store has been piped by a plumber or a gasfitter following a set of plans drafted by an architect. The average architect thinks the lighting feature of his work is of no importance. The lighting arrangement is left until the last. After drawings are almost complete, after all painting has been specified, all decorations decided upon, all ventilation arranged, all store fixtures arranged, he picks up a pencil and says: "We will put an opening here, one there, one there, etc." He does not contemplate the illumination when deciding colors and styles of decoration or ventilation; he does not calculate illumination at all, but just puts in lamp openings. It is often found that the consumer's lighting system is at present just as good as it has ever been, but owing to the fact that his neighbors have improved their systems, his installation seems to have deteriorated. Frequently no difficulty is experienced in holding the business, even when the complaint is based on a high bill, for the improved lamps often make it possible to give a consumer twice, even three times, the illumination he had obtained previously.

When the consumer consents to have the illuminating engineering department measure his store and make suggestions for better illumination, a drawing is made showing all of the walls, windows, doors, hallways, show windows, etc. Then if the consumer contemplates any changes in the rooms or building a note is made of them, and often they are arranged for on the drawings if the changes are to be made immediately. In case there is sufficient time the openings for the lamps are so arranged that when the building is changed the proper system will be in readiness. The openings that are made in contemplation of changes are plugged and no fixtures are installed. The fixtures are specially designed or selected and specifications are drawn. The drawings and specifications are submitted to the consumer and, if the plans are accepted, bids are asked on the work and taken to the consumer, and the contractor is thus selected. The work of installation is superintended by the illuminating engineering department until completed and accepted by the consumer. When the new lighting system is placed in operation the central station reaps the harvest of the work of the illuminating engineering department. No matter how bitter he may have been in his complaints, almost invariably a consumer will become very much enthused over the improved appearance of his store. He can then easily be induced to step outside of his store and compare the outside with the improved interior. He does not wait to be coaxed, but usually says, "What can we do about those windows and that sign?" It is not the actual amount of money the consumer pays that interests him, but how much he gets for his money. When the illuminating engineering department, by a rearrangement or a new system, gives him three times as much illumination as before, the consumer is glad to pay the bill; the illuminating engineering department has held the business, and the consumer becomes immediately a prospective consumer for better window lighting and sign advertising.

A record is kept of the work, by taking a small kodak picture of the drawing and pasting it to a reference card, which is filed for future use. The means used for keeping this record is a cabinet card, showing the date, name, address, nature of business or building, installation made, style of glassware, ceiling height, color, decorations, size of room, watts per square feet, density, reasons for changing, previous installation and remarks.

A photo of the original accepted drawing is placed on this card and filed for future reference. This card is cheap and convenient to refer to later and takes little room. The consumer often wants the original drawing for other structural work, and if he so desires it is given to him, the company being released from responsibility if errors in measurement are made from the drawing, such as structural iron being short, millwork and metal ceiling not fitting, etc. Cards are also used in keeping a record of new buildings. A record is kept of all building permits. Cards are sent to new owners, architects and contractors, offering services of the illuminating engineering department.

All representatives are given an opportunity to join an illuminating engineering class during the fall of each year, and those who join are given a series of lectures and instruction along illuminating engineering lines. They are taught to read drawings, and are instructed in a few principles of fixture designing. The object of this course is to teach the commercial men the principles of illuminating engineering, in order that they may correct small mistakes as they proceed in their work each day, when small additions and alterations are being made. They are also given information and data regarding new shades, lamps, etc., and the uses to which they can be put.

Practical Value of Illuminating Engineering to the Central Station.

[Prepared by Mr. John F. Gilchrist, Chicago, Ills., for the Fourth Convention, Illuminating Engineering Society.]

The practical value of illuminating engineering to the central station is the value which a very high order of education on the part of those handling the selling end of any business gives to that business. When a person enters the shop of a large dealer in porcelain and china and meets a salesman who not only knows his stock, and what is being manufactured throughout the world in his line at the present day, but is well educated in the history of porcelain and china manufacture, and knows all of the different wares, their values, their

peculiarities—one whose taste is cultivated to the point of dependability—he is inspired with a confidence which assures him that whatever is purchased under the advice of this salesman will bear the criticism of a connoisseur, and he is quite likely to become a customer of that shop.

On the other hand, if a person enters another shop where there is an equally good stock and assortment of goods, and is taken in hand by an indifferent salesman who can only lead one to the counters and leave him to grope in the darkness of his own inexperience, he is more than likely to be so annoyed, disgusted and overcome with the feeling that he cannot depend upon his own judgment, that, rather than take the chance of making a mistake, he will defer his purchase or go where he can get good advice. By this experiment one can demonstrate the experience and results which will follow with a potential purchaser of electricity for lighting, when in the one instance he falls into the hands of the expert who has equipped himself with a thorough knowledge of illuminating engineering where in the other he is waited on by the ordinary, inexperienced solicitor generally found selling electricity.

In other words, illuminating engineering is simply a very high order of information and intelligence as to light and the quality, quantities and arrangement necessary to obtain the best results for given purposes.

There can be no doubt as to the great desirability, from the standpoint of their own interests, of the central stations fostering the development of illuminating engineering and the training of the young men in the industry to a thorough knowledge and appreciation of the fundamental principles of proper illumination. Until within the past few years a comparatively small number of men in the electric lighting business have been impressed with the importance of this sort of intelligence and training, the attention of most of the best minds having been directed toward the development and operation of apparatus for the generation of electricity, and to the engineering problems which pertain to the transforming and the distributing systems incidental to the supply of energy to customers from a central station plant. It is only recently that, through the work of specialists advanced in their profession, and the influence of the Illuminating Engineering Society and kindred organizations, intelligent attention has been given to the very important matters of utilizing the light produced, in the most proper, hygienic and economical ways.

Under this new order, however, remarkable progress has already been made in the development of illuminants which are more economical and which are better adapted for various forms of lighting, and the standard of artificial illumination has been increased more, perhaps, than the standard of any other modern product. To appreciate this fact fully, one who has been in the business for any considerable length of time has only to compare the illumination in the store of some conservative customer where, 5 or 6 years ago, he laid out a system of illumination in which he took great pride, and which has not subsequently been changed, with what he considers proper present day illumination in some similar store recently equipped.

The above simple observation will prove several things. It will prove the advance in the standard of illumination. It will prove, to those who have looked on both installations as masterpieces of the period, how much advancement has been made in the knowledge of illuminating engineering, although the obtaining of this education may have been involuntary and by a process of absorption rather than through any premeditated effort. But the old, unchanged, installation by its very rareness will prove to what an extent the layman has acceded to the compelling force of the times demanding higher standards of illumination.

It is in this point of the education of the customer that one of the great practical values of illuminating engineering to the central station lies. The progressive layman will rarely turn a deaf ear to reasonable views and advice tending toward better illumination. Very true, most users of electricity hesitate to increase their expense, but the central station man has often heard the statement made by a customer somewhat as follows: "I believe in plenty of light. I am not satisfied with my lighting arrangements, although the cost seems to be all that I can stand. Can you not make some suggestion which will give me more light for what I am paying, or even a little more than I am paying? If I could get 3 or 4 times the amount of illumination for an increased expenditure, of from 50 to 100 per cent., I would very gladly make the arrangement." This may seem to-day rather an impossible proposition, but it sounded more impossible 10 years ago, and yet, at the same price per kw.-hour for electricity, the customer's wish has in that period been more than met as the result of the great development in illuminants themselves and the greater intelligence in the placing of these illuminants.

The central station manager should wake up thoroughly to the fact that, in the lighting end of his business, what he should sell is an effective and useful illumination, and not merely electricity; but he cannot sell the former without the aid of representatives who are thoroughly well educated and up-to-date in matters of illumination, and in such representatives he has nothing more or less than a corps of illuminating engineers, despite any prejudices he may entertain.

Leaving for a moment some of the direct advantages of illuminating engineering to the central station, there is an indirect, though none the less practical, advantage which should not be overlooked. One of the great difficulties in organizing a department for the sale of electricity for lighting purposes is the difficulty in obtaining and holding the services of men in these departments who have had engineering training. Their inclinations are to belittle this important end of the business and to secure occupation in the departments of operation and construction of plant. This is undoubtedly due to the fact that they consider these other departments offer better opportunity for the use and development of their technical knowledge, affording, in plain language, more interesting employment. They can hardly be blamed for holding this opinion under the old condition of things, when the obtaining of an electric light customer was more a question of legs than of brains. However, the development of illuminating engineering, with all of its interesting problems and possibilities, is rapidly demonstrating to this class of men there is a great deal worthy of their brains and talents to be found in the scientific sale of illumination. Consequently the electric light companies are able to hold in their selling departments a class of men who are not only capable of getting good practical results, but who are abreast of the times and who are not losing any opportunities to put to practical use very promptly new ideas which are developing all over the world, and which are being reported weekly in the columns of the technical press.

The Illuminating Engineering Society has accomplished a vast amount of good for the central stations in the work which it has done up to the present time. Perhaps it has not received the hearty support of the central stations in the measure that it should have, but the work is only begun and it should feel only the greatest amount of encouragement for what it has accomplished and keep on in a larger way year by year. Central station managers must see their interests, and be shown them if they do not see them, and a larger number of the rank and file of the young men selling illumination must be secured as members of the Society and placed within the influence of its educational features.

A splendid advance has been made in the course of lectures which has been arranged to follow the convention of the Society, and undoubtedly a large number will take advantage of the opportunity offered, but unfortunately, whatever this number is, it will be relatively small when the whole number of men in the business is taken into consideration. The Society should consider some means of extending these benefits to a very much greater number of men engaged in the practical work of selling illumination than could possibly be gathered together at any one place. Results could possibly be accomplished by giving this form of instruction from several centers, or, better yet, some correspondence arrangement, with examinations, etc., might be arranged, which would insure the proper amount of individual work on the part of students.

With the proper stirring up, there should be no difficulty in providing the necessary funds for such courses of instruction, because, from the standpoint of the central station, there is no more practical work in the industry than that being done by the Illuminating Engineering Society.

Publicity and Public Policy.

[A paper prepared by Mr. C. W. Lee, October Meeting, Illinois State Electric Association.]

It was less than a decade ago that the average public service company arrived at a realization of the exact relationship it bore to the community. No matter what criticism may be made of the former public policy of these corporations, since then the majority have been earnestly striving to effect a better understanding with their communities. It must be acknowledged, however, that these efforts have not always been well directed, nor have they been generally successful, for there are to-day few communities in the United States that

can be said to have due regard for the rights of the public utility or a proper conception of its problems.

Not only has the public been inclined to view every act of these concerns with suspicion, but so hostile is the sentiment in many places that campaigns of aggressi on have been undertaken by public officials and local bosses merely as a political expedient. And the companies themselves, knowing not where to turn for protection, have sought to curry favor both with the public and the politicians. Alliances have been entered into which are as harmful in the long run as they are costly, and the public, which is ready to applaud the efforts of the politicians to embarrass these corporations, finds only in their political alliances corroboration of its previously formed views concerning corporate iniquity. But, while many of the defensive methods which have been resorted to in the past by public utilities are unjustifiable from an ethical standpoint, they have been adopted, for the most part, not to secure special privileges, but to protect vested rights, threatened either by unreasoning public clamor or political highwaymen. The sooner the present attitude of the public is understood by the men whose duty it is to preserve the tremendous investment in these properties, the sooner shall we arrive at the age of economic reason.

Whatever else has been demonstrated by the agitation of the last few years it is patent to all observers that the old order of things is passing, and that in the future the corporations must take their cases directly to the people instead of to the politicians. In other words, public sentiment, which in the past has been used as a means of exacting tribute from utility companies, must in the future be utilized by these very corporations to secure legislative justice.

We have every reason to congratulate ourselves on this changed condition, for there is not a single community so lacking in a sense of fair play or reasoning power that it cannot be made to see the public utility problems in their true light, if given an opportunity to do so. This opportunity must be supplied by the individual companies themselves, for there are no two companies whose problems are identical or, for that matter, whose communities take the same viewpoint.

Evidence is constantly accumulating that the leaders of these kindred industries have begun to recognize the importance of a general educational effort being made, not only for the puppose of checking the spread of false economic theories, but to vigorously uphold by the force of truth and logic the rights of the public utility.

Less than a fortnight ago President James A. Shaw, of the American Street Railway Association, in his address made at the annual convention of that organization at Atlantic City, handled the subject in the following manner:

"We have suffered in the past from public ignorance, for which we ourselves are to blame perhaps as much as, if not more, than the public. In too many cases, perhaps, we have shown a disposition to remain silent when incorrect statements have been made concerning our own properties or concerning electric railway properties in general. It is time now not only to be ready to give the facts when asked, but to take the initiative and do our part in making them public, so that misapprehension as to the correct condition of affairs will decrease."

At about the same time President Shaw was making these remarks Gen. George H. Harries was telling the Transportation and Traffic Association that, "a campaign of reason, of education is the present duty." That concrete results are achieved by those utility companies that adopt a policy of publicity is proven by instances almost too numerous to cite.

In Maysville, Ky., only 2 weeks ago, the City Council rescinded an ordinance for the construction of a municipal gas and electric plant as the direct result of a campaign of education, conducted through a series of daily "Talks" in the advertising columns of the local newspapers.

In your President's home city, of Kewanee, a few months ago, the Kewanee Light and Power Company secured 65 per cent. of the front footage consents, including 90 per cent. of the gas and electric consumers, for a new 30-year franchise as a result of a similar campaign, although several years previous, without the aid of publicity, it was able to secure but 15 per cent. The fact that the local Council has not granted this franchise does not impair the value of the illustration, but shows rather that the members of that particular Council were actuated by motives entirely apart from a desire to serve the public, The consents, by the way, can be presented to the new Council, which may be more representative of the local public.

At Louisville, Ky., a merger of all the electric and gas properties is at present underway, and the companies have seen fit, through the medium of the advertising columns of the daily newspapers, to carefully analyze every section of the proposed new merger franchise. It is simply another straw showing the trend of the times.

In Haverhill, Mass., the establishment of a municipal electric plant will be submitted to a referendum vote in December, and the local Company, ignoring the politician, is about to begin a thorough exposition of the municipal ownership problem in the newspapers of that city.

These are but a few of the recent cases where concrete results have been achieved by means of publicity. Indeed, almost invariably, when there is a direct issue the public utility can secure a victory by placing its case fairly and squarely before the public, provided, of course, that its case is a just one. It matters not whether the issue involves a question of franchise rights, municipal ownership, ruinous competition, rates or any of the kindred issues with which you are familiar. If the company's case is presented in a skilful and convincing manner, after an analytical study of local conditions and sentiment has been made, then there need be no fear as to the outcome of the campaign.

But it is not alone in achieving concrete results that publicity is of value. In many communities there is a deep rooted, though frequently unwarranted, hostility toward the local public utility corporations. Sometimes this finds expression merely in public criticism or perhaps is shown in the reports of the new business department; but sooner or later there will be an occasion when this sentiment will crystallize into some form that will work serious injury to the company against which it is directed.

An ounce of prevention is indeed worth a pound of cure, for it is safe to state that 90 per cent. of the municipal and competing plants would not have been built and the same proportion of the present unjust State and city laws would not have been enacted had publicity been resorted to as a means of overcoming this adverse local sentiment.

The expense of a properly conducted campaign very frequently frightens the managers of a small plant, but they lose sight of the fact that aside from its main purpose it is the very best business producing advertising obtainable. In Buffalo, N. Y., a campaign was undertaken for the purpose of overcoming a hostile local sentiment and of justifying the company's rates and system of charge. This was signally successful, but moreover during the progress of the campaign the new business secured more than repaid the Company for the expenditure, although no direct effort was made in the advertising to secure commercial results. The new connections simply reflected in a practical manner the rehabilitation of the company in the esteem of the community.

It has been truly said that public goodwill is a utility company's most valuable asset. To possess and hold this asset should be the duty of the local manager of to-day.

Budget of Wrinkles, Submitted by William Schade, Editor Wrinkle Department, Pacific Coast Gas Association, 18th Meeting, Los Angeles, Cal.

No. 1.—*Meter Cocks.*—In changing the method of connecting meters from lead pipe to solid iron connections, we have accumulated a large number of ¾-inch meter cocks of the type used with lead connections, and to utilize these cocks we hit upon the following plan:

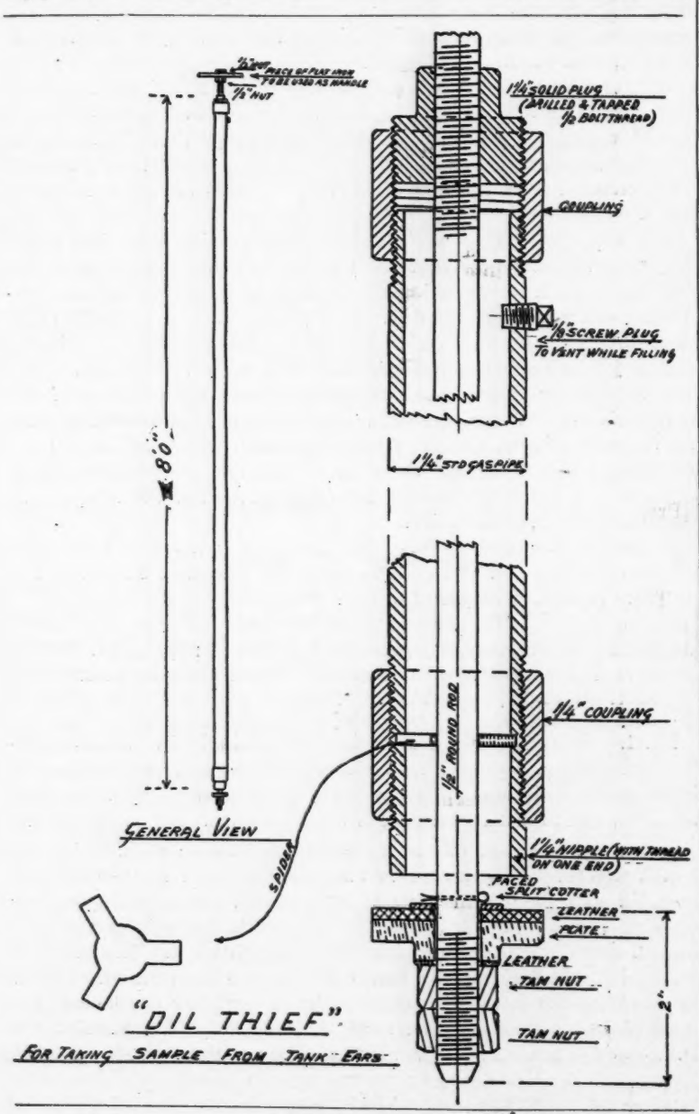
Cut off about ⅛ inch of the tapered end of meter cock, and cut a ¾-inch pipe thread on the cock. Then take a ¾-inch malleable coupling, tin both the threads on the cock and in the coupling by immersing in a melting pot of hot solder, and, when both are well tinned, screw them together in a vise while still hot. This makes a solid joint, and the coupling cannot be removed from the cock except by reheating the same. If desired, a brass coupling can be used instead of the malleable iron one.—W. J. Dorr, Supt. Gas Distribution Division, Los Angeles Gas and Electric Corporation.

No. 2.—*Treatment of Iron Oxide.*—The treatment of iron oxide, as commonly used at the present time in gas purification, by the introduction of steam in small quantities, at the top of the box through the cover, when reviving the material, has been of great assistance to us in Stockton. This process was put in operation early this spring, when it appeared that the purification capacity was not sufficient to meet the demands of the gas being manufactured. The plant is equipped with a set of 4 boxes, 14 by 14 by 3, connected to a center seal valve. A 4-inch connection is made to each box under the trays, connected to a No. 1 Sturtevant fan for reviving. The oxide was

prepared according to a formula in general use on this Coast. It was our custom to raise the covers and revivify at least 3 boxes daily. Since we began using steam we have not raised a box for 4 months, and they are still in good working condition at the present time.

The small amount of condensation which takes place serves to maintain the oxide in a moistened condition, naturally aiding its activity, and the results realized by us from this comparatively simple operation have been most satisfactory. This wrinkle is not mentioned to the Association as a matter of particularly new practice, having been in more or less general use for several years past. We feel, however, that some of the members may have lost sight of this application of a well known principle, and hope that it may be worthy of their attention as a means of relieving them, as it has relieved us, from some of the ills to which the "gas house terrier" is at all times heir.—JAMES E. KELLY, Stockton Gas and Electric Corporation.

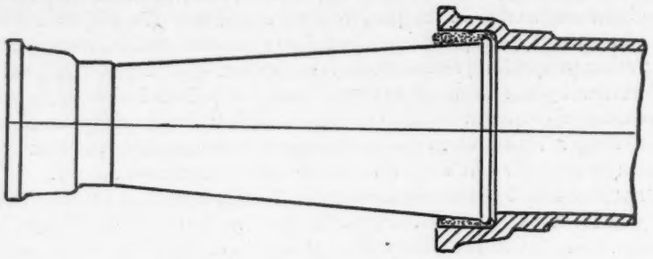
No. 3.—*Oil Thief.*—The inclosed sketch shows a simple form of a device known as an oil "thief," used for the purpose of taking a uniform sample of oil from tank cars, the operation thereof being as follows: Open the valve at bottom of "thief" by screwing down an interior rod; remove ¼-inch vent plug at top of "thief;" lower "thief" through opening in dome of car, allowing it to drop slowly in order to preserve uniform level of oil in car and in "thief" during process of lowering. When "thief" has reached bottom of car,



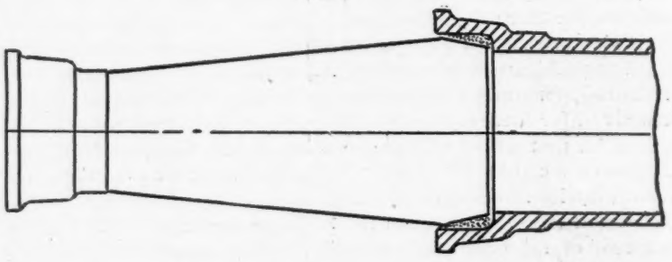
Wrinkle No. 3.

and is full, close valve by screwing upward on interior rod and insert vent plug, then withdraw "thief," which by reason of being closed can be handled in a horizontal position without spilling. As the regulations of oil companies provide that samples of oil shall not be taken from cars at a lower distance than 2 inches from the bottom, this instrument is designed so that, when open, the lowermost thereof will rest on the bottom of car, leaving the necessary 2-inch space between bottom of car and bottom of "thief" inlet. This device is very simple and inexpensive and can be made from materials usually on hand in any gas works.—LEON P. LOWE.

No. 4.—*Suggestion for Cast Iron Pipe Reducers.*—I would suggest as a wrinkle that cast iron pipe reducers be made with *spigot and tapered*, after the manner of the plugs that are to be knocked out, so that they (the reducers) can be received in the bell of tee or cross without having to remove the lead, by simply forcing in a caulk, thus saving time and annoyance. Also, the ease at some future time with which the reducer can be removed in case a larger diameter main is required, as it is rather a hard job to remove a leaded end from a bell when you are in a hurry. We remove plugs with a clamp-and-screw jacked against the bell.



PRESENT STYLE HARD TO REMOVE ON ACCOUNT OF LEAD



PROPOSED WRINKLE WITH TAPERED END SIMILAR TO THE PLUG.

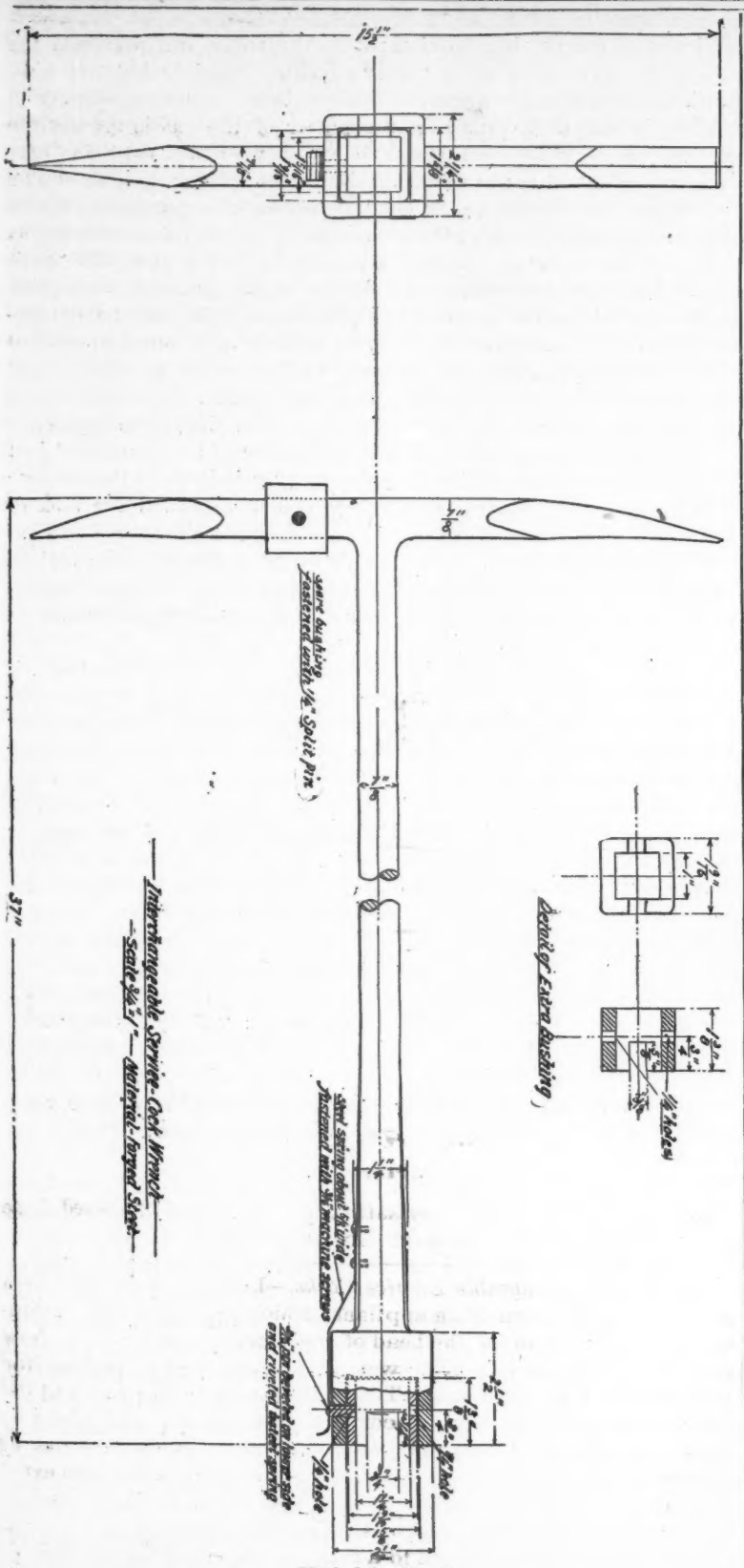
Wrinkle No. 4.

I have found this mode very satisfactory and have subjected these joints to heavy pressure without detriment.—INCOG.

No. 5.—*Interchangeable Service Cocks.*—I am inclosing herewith a couple of blue prints of an appliance which might possibly be considered as coming under the head of your department. These show interchangeable service cock wrench for use in emergencies for various sizes of service cocks. The print is merely of a type, and the principle may be changed, of course, to suit conditions. The tool shown is intended to use for either flat-head or tee-head cocks of three different sizes; the wrench itself taking one size and two extra bushings, one of which is carried in place, the other being attached to the handle with split pin, as shown. The bushings are held in place by a little pin attached to a spring. The tool was devised by the foreman of our Meter Department at Oakland, Mr. J. J. Mulgrew.

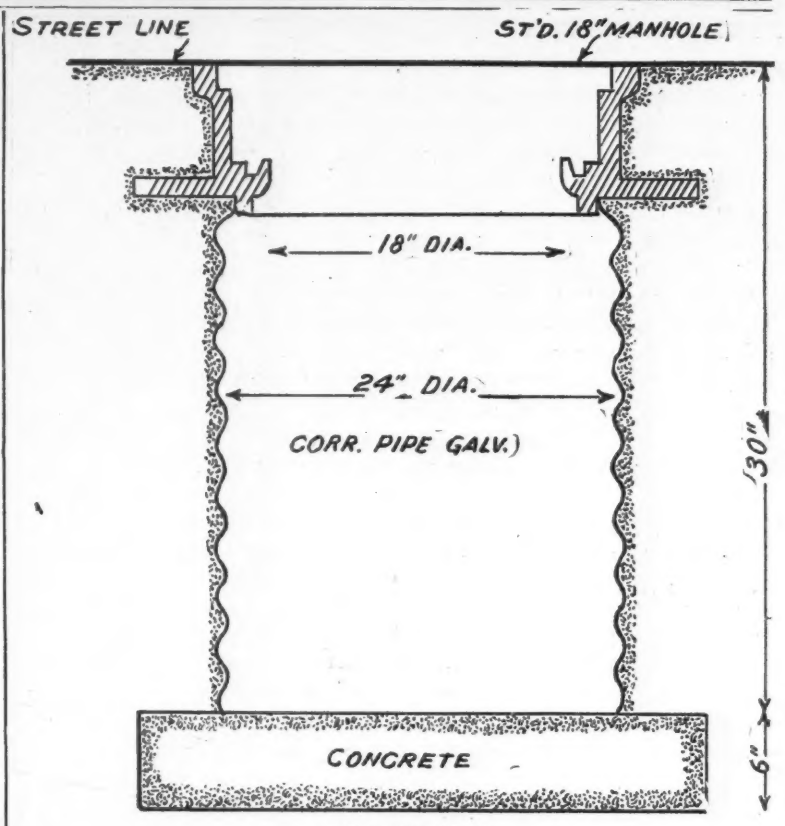
No. 6.—*Service Manholes.*—Inclosed please find blue print, showing service manhole which we have found inexpensive to construct, that is very much cheaper than brick or concrete and which meets all requirements. Tests made indicate that "Toucan Metal" will last a great many years. I do not know, however, that it is being used except for culverts. The manhole is used by this Company in improved streets at intersections where valves are installed.—QUERY.

No. 7.—*Cleaning Standpipes.*—Our large generators have 30-inch outlet pipes. To clean the standpipes is quite a task, and was made more difficult by the fact that a 30-inch, cast iron flange had to be moved each time in order to get access to the pipe. We relieved this part of the trouble by using a 12-inch, "hat-flange" on the 30-inch flange. This is simply a 12-inch nozzle in the center of the 30-inch flange, and is closed by a 12-inch blind flange. This is of a size which one man can easily handle, and allows plenty of room for cleaning, but does not permit the escape of so much heat, resulting in the work being done more quickly and easily than heretofore.—D. J. YOUNG, Supt. Gas Manufacture, Los Angeles Gas and Electric Corporation.



Wrinkle No. 5.

No. 8.—A great many times the complaint department of the gas company is called upon to fix the burner in a gas range, and I have found that a very simple remedy for fixing the upper burner is to ignite the gas in the mixer and let the burner become heated. After heating it is removed and all the grease will have been burned off of the inside of the casting. This is a very simple and effective means of cleaning a gas range burner. I also submit a wrinkle to be used in connection with installing a drip on a street main. It sometimes happens that water accumulates in low spots and it is necessary to put in a drip after the original installation of the pipe. On a high pressure line it is very difficult to tap the main on the bottom, so the best method is to take two saddles and fasten them on the pipe, one on top and one on bottom. The bottom saddle can be put on without the stop cock and in its place use a street ell to run off to the drip. After this connection is made the pipe can be drilled from the top right through the bottom. This makes a very convenient and easy method of putting in a drip, and, while the cost is slightly more, it is more than overcome by the saving on drilling of hole on the bottom. One of the best wrinkles that I know of, and I am not sure whether



Wrinkle No. 6.

it has been before the Association before; but I will, however, submit it, and you can put it in if you like. It is more or less disagreeable to have a boiler blow off around a gas plant, on account of the dirt and noise, and a very effectual means of deadening the sound, together with its cleansing effect, is to connect up all of the gas scrubbers with the boiler blow-off. By this means the scrubbers can be kept thoroughly clean and flushed out daily with the water that is usually blown off into a sump hole. I also find, if the blow-off line is connected into connecting lines between scrubbers, that it has a very effectual way of keeping all of the pipes clear and does away with the danger of gas works stoppages.—S. C. Lowe, Los Angeles.

[Continued from page 821.]

Liability of Gas Companies for Injuries Resulting from Escape of Gas.

[Prepared for the Journal, by Mr. John Edson Brady, Attorney-at-Law.]

Injuries Caused by Inhalation.

The plaintiff in the case of Ferguson *v.* Boston Gas Light Company; 170 Mass., 182, 49 N. E., 115 (1898), was a dressmaker occupying rooms in a house on Dartmouth street, Boston. Tho only gas fixtures in the room were a chandelier, which hung in the center of the room, and a single bracket, side light. The gas bills of the defendant Company contained the following announcement: "As soon as a leak is perceived, whether by day or night, immediate notice should be sent to the West street office of the Company. When the smell of gas is apparent in a room, no light or fire should be permitted and especially no match should be lighted; the windows should be, opened and the room left unoccupied." The plaintiff testified that she noticed the odor of escaping gas in one of her rooms and that the Company sent a man the same day to repair it. After he had worked on the chandelier about 20 minutes he told her it was all right. She did not notice the odor of gas again that evening. After she had retired gas escaped from the chandelier and she was seriously injured by inhaling it. An expert testified that the gas used in this instance, being water gas, "Contained carbonic oxide, which is the dangerous element of gas, mixed with naphtha fumes, among other elements; that the carbonic oxide is comparatively inodorous, and is the heaviest element, and descends, while naphtha fumes rise; and that the odorous part of this gas is not dangerous." There was also evidence that the defendant's gas contained about 25 per cent. of carbonic oxide, and that carbonic oxide is a deadly poison. It was held that the question of the Company's negligence was one for the jury to decide. "The evidence would clearly justify a finding," said the court, "that the defendant undertook to find and stop the leak of gas, and in pursuance of this understanding sent a workman who attempted to fix the chandelier in the plaintiff's room. Entering upon the work the

defendant was bound to do it with reasonable care. In our opinion the evidence would also justify a finding that the work was not done with reasonable care, but negligently, and that the plaintiff's injury was the consequence of this negligence, and was not occasioned or contributed to by any act or fault of her own. The case should have been left to the jury."

Duty of Company as to Construction and Location of Pipes.—An action for injuries from inhaling illuminating gas was brought against a Massachusetts gas company, in 1904, by a woman, 35 years old, who testified that she had never before smelled gas, and was, therefore, unable to recognize its odor when it permeated her house. Thompson *v.* Cambridge Gas Light Company; 201 Mass., 77; 87 N. E. Rep., 486. The plaintiff noticed the odor early in the morning, but, not knowing what it was, remained in the house without taking any steps to have the matter remedied, until she became unconscious. The gas, it seems, had escaped from one of the defendant's mains running past the house. The defendant's foreman testified that the pipe was comparatively new, having been laid but 8 years before the accident; that the top of the pipe was 3 feet 6 inches below the surface of the street; that in his opinion the pipe was caused to break by the contraction due to cold weather; that the land where the pipe was laid was made land, filled with detritus and ashes, and that through this gas would filter more readily than through clay, but not so readily as through sand or gravel, and that, with the soil frozen as it was, if a pipe broke the tendency of the gas would not be to rise, but to percolate sideways until it reached some such place as a cellar. The Company was held liable, not only to the woman for the injuries which she received, but to her husband as well for the loss of his wife's services occasioned by her illness. The court said in the opinion: "The female plaintiff testified that she had never used illuminating gas, did not know how it smelled, and did not know what caused the odor. If she did not know that it was illuminating gas she was clearly not at fault in not notifying the defendant. Whether she could or should have done anything else to remedy the condition that had arisen, and was in the exercise of due care in remaining in her tenement as she did, was plainly for the jury. * * * The defendant contends that there was no evidence of negligence on its part and that the break in the pipe was caused by the contraction due to cold weather, as its foreman testified. But the jury might properly have found, and for aught that appears did find, that the pipe would not have cracked in the manner in which it did if it had been properly laid, and that it should have been laid deeper. It was the defendant's duty to see that the pipe was laid in the ground at a suitable depth and in a suitable manner and kept in proper repair. And it was for the jury to say upon all of the evidence whether the defendant had performed that duty and whether the breaking of the pipe was due to causes beyond its control, or which could not reasonably have been anticipated by it, or whether it was due to negligence on its part."

The duty of a gas company to properly place its pipes was the theme which occupied the attention of the court in the case of Sipple *v.* Laclede Gas Light Company; 125 Mo. App., 81; 102 S. W. Rep., 608. The plaintiff was an infant, suing for the death of his father by asphyxiation. In substance it was alleged that the defendant Gas Company negligently permitted one of its mains to become defective and leak, whereby illuminating gas escaped into the room in which plaintiff's father was sleeping, and caused his death. There was no direct proof introduced on the part of the plaintiff tending to establish any specific neglect of duty with respect to the defect or crack in the main, from which the gas escaped, the entire proof on this question being that, by the odor, gas was discovered to be escaping in the vicinity about noon on Saturday, and that, when the leak was finally located on the following day, it was found to have been caused by a crack in the defendant's 4-inch main, running through the street near the room in which the deceased was asphyxiated. The defendant's superintendent testified that it was a new crack, which might have existed a few days. The plaintiff recovered a verdict of $2,000.

The general rule is that the mere fact of the breaking of a gas main, and the consequent escape of gas, standing alone, do not constitute negligence, but such proof is sufficient to warrant a jury in finding negligence. We quote from the opinion: "From a careful study of gas cases elsewhere, and with due attention to the judgment of the soundest courts and opinions of the ablest judges in the country, we have been able to determine and ascertain the rule that, in view of the highly dangerous character of the commodity being transmitted by the gas company through its mains, and because of its well known tendency to escape therefrom through the earth and permeate the atmosphere as an element not only entailing possible but probable death and disaster, the principle applicable to its transmission and conduct is that the producer or transmitter of the gas is required to conduct his operations in that behalf with a very high degree of care and skill, * * * even though this degree of care might extend the requirement in that behalf slightly beyond the general rule with respect to the exercise of ordinary care to avoid such dangers only as are to be reasonably anticipated in the conduct of a particular business. And, therefore, under the influence of this principle, the mains being made to conduct gas and conduct it safely, it was the defendant's duty to exercise that high degree of care mentioned to see that they were constructed in proper form and of proper materials; that they were laid in the earth at a proper depth and in a suitable manner so as not to be affected by the frost, and kept in proper repair for the purpose intended, and upon the application of the sound and just principle stated, the courts have universally adjudged, in the absence of an intervening agency appearing, which negatives the idea of negligence on the part af the gas company, that *prima facie* proof is made on the question of negligence by showing the break or leak in the main and the consequent escape of gas which operated proximately to cause the loss. Such proof is sufficient to sustain the inference of negligence by the jury."

In Smith *v.* Boston Gas Light Company; 122 Mass., 318 (1880), it appeared that the plaintiff (a very young child) occupied a room with his mother in a house which was not piped for gas. A gas main belonging to the defendant, which ran through a courtyard adjoining the house, cracked and the gas which escaped seriously injured the plaintiff and caused the mother's death by asphyxiation. There was no evidence that the plaintiff or his mother had notice of the escaping gas or was conscious of its presence in the room, in time to leave or to take any precautions to prevent the consequences by opening the doors or windows. It was shown that, on the day before the accident, there was no smell of gas in the courtyard. It was also shown that the plaintiff's mother was a sober and industrious woman. It was held that the defendant Company was liable for damages. This was affirmed on appeal, where the court said: "The jury may well have found that the crack in the pipe and the escape of gas first occurred some time during the night of the accident, and would be justified in finding that neither the plaintiff nor his mother were chargeable with want of ordinary care in preventing or escaping the result."

In the opinion it was also said: "The jury, upon the evidence here reported, would, in our opinion, be justified in finding the defendant guilty of the negligence charged. The escape of gas from a defective pipe into the room occupied by the plaintiff, with no explanation of the cause other than here offered, was some evidence of neglect. The pipes were made to contain the gas and conduct it safely, and it was the defendant's duty to see that they were constructed in a proper form and of proper material, and that they were laid in the ground at a suitable depth and in a suitable manner, and kept in proper repair for that purpose. The construction and care of the works were exclusively in the hands of the defendant, and no cause independently of some negligence on its part is shown to have produced the effect."

The judge ruled at the trial "that there was evidence enough of want of proper care on the part of the defendant to make it responsible, on the ground that it was bound to conduct the gas in a proper manner; and the fact that the gas escaped was *prima facie* evidence of some neglect on the part of the defendant." On appeal the defendant objected to this ruling, on the ground that its effect was to make the defendant an insurer against accident by the escape of its gas. On this point the Appellate Court said: "The defendant was authorized by law to lay down pipes and convey gas under the surface of the public streets, and was bound to use proper care and prudence in the conduct of its business, having reference to the delicate and dangerous character of the material in its charge. It was especially bound to exercise this care in the proper location and repair of the pipes, so that there would be no escape of gas dangerous to life and health. The question was plainly ruled upon as a question of negligence to be left to the jury. The evident intent and reasonable understanding of the ruling of the judge were this and no more, that there was sufficient evidence upon that question to warrant the jury in finding a verdict for the plaintiff. The language used cannot be fairly construed as imposing absolute liability upon the defendant for the escape of gas, without regard to the question of negligence, or as asserting that the defendant was bound at its peril not to permit its escape."

The Duty of Inspection.

In addition to carefully laying sound pipes, gas companies are bound to maintain a reasonably efficient system of inspection of their pipes after they are laid. The decisions indicate to what extent the companies must go in this regard. In Greaney *v.* Holyoke Water Power Company; 174 Mass., 439; 54 N. E. Rep., 880, two plaintiffs gave evidence to show that they had been rendered unconscious and made seriously ill by the inhalation of illuminating gas which escaped from the gas main of the defendant into the cellar of the tenement, where the plaintiffs lived. They went to bed at about 11 o'clock, the evening of January 18, 1898, and were found unconscious by a policeman and others, who broke into the house at about half-past six the next evening. When they went to bed they noticed nothing unusual, and when they were taken out there was a strong smell of gas in the house. The house was not piped for gas. The street opposite the house was dug up and the gas pipe running through it was found to be broken. The evidence in regard to the condition of the pipe was conflicting, some witnesses testifying that the break was zigzag, extending nearly a foot along and around the pipe, and that the pipe was very rusty, others saying that the break looked as if it was fresh and new. Evidence was introduced tending to show that in August or September, 1895, a sewer was constructed through the street at a depth considerably below the gas pipe, and that the earth which was put back was not properly tamped, and that the break was caused by the settling of the earth. It was also shown that there was a strong smell of gas in the street opposite the plaintiffs' house during the afternoon before the plaintiffs were discovered unconscious. It was held that the court properly submitted to the jury the question of the defendant's negligence. The jury found that the defendant was negligent and damages were accordingly awarded to the plaintiffs. We quote from the opinion: "The danger of explosion when gas escapes into a cellar or building, and the probability of death or serious bodily injury from the inhalation of it, are so great that gas companies are rightly held to the exercise of a high degree of care to keep their gas confined. Their care should be proportioned to the danger. On the other hand, they are not insurers against possible accidents. In the present case we think there was evidence to submit to the jury in favor of the plaintiffs on the question whether there was negligence on the part of the defendant in allowing the gas to escape into the plaintiff's cellar for so long a time. * * * There was some evidence tending to show that the Company did not know that a sewer had been constructed through this street. The jury might have found that due care on the part of the defendant would have discovered the existence of a sewer there, and would have found that the earth had settled, and would be likely to cause, or had already caused, a break in the pipe, or that such care would otherwise have prevented the use of a broken pipe in this street at the time of the accident."

A city employee was killed by inhaling gas while in the cellar of a building belonging to the defendant gas company for the purpose of reading the water meter. There was no evidence as to how the gas got into the cellar. It was simply shown that the gas was there and that the ventilation of the cellar was stopped up. It was held on appeal to be error to direct a verdict for the defendant. Finnegan *v.* Fall River Gas Works Company; 159 Mass., 311. The Company, by taking water, entered into a relation which it knew would require some one to visit the premises for the purpose of reading the water meter, and it was bound to exercise reasonable care to prevent the cellar, where the water meter was placed, from becoming a death trap. It was for the jury to say whether or not the Company should have known of the presence of gas in the cellar in quantities sufficient to be dangerous to human life, or whether it might have prevented such accumulation of gas by keeping the cellar properly ventilated, or whether, in the exercise of due care, the Company should have seen to it that the meter was put in a different place. The case was accordingly sent back for a new trial.

In one case it was said: "Where the existence of a leak is known, means should be taken at once to avoid injury, and where it should have been known that a leak was likely to occur, because of the defective condition of the pipe, negligence may be imputed; but it is not reasonable to require gas companies to uncover their pipes without reference to the existence or non-existence of leaks. Morgan *v.* United Gas Improvement Company; 214 Pa., 110; 63 Atl. Rep., 417 (1906). In this case the plaintiff had sustained injuries by inhaling gas which had escaped from the defendant's pipes into his cellar. The plaintiff's house was one of a row, only one of which (the fourth from the plaintiff's) was piped for gas. Two weeks prior to the accident the odor of gas was noticed in the house which was connected with the main. The defendant was notified of this, and its inspector examined the gas fixtures and discovered no defects in them. The service pipes leading from the street to this house were under the control of its owner. Two hours before the accident the employees of the Company, while digging in the street in front of the plaintiff's house, threw out with their shovels two pieces of broken gas pipe. It was not shown that these were pieces of the defendant's pipe. It was held that these facts did not establish negligence on the part of the Company.

In the absence of any facts upon which to base an inference of duty, a court cannot infer a general obligation to inspect the pipes of a private house, which are not under the control of the Company and as to which it has no apparent relation other than the fact that its gas is to be used through the pipes placed therein by the owner, as it has suited him to have them. In Smith *v.* Pawtucket Gas Company; 24 R. I., 292, it was attempted to hold the Gas Company liable for negligence in introducing gas into the plaintiff's house, on the ground that the Company installed a meter with carelessness and "did not inspect or test the gas pipes therein, which had long been out of use, to make sure that the said pipes were in suitable condition to receive said gas." It was held that this did not make out a case of negligence. One who applies for gas is presumed to have knowledge of the danger, and the duty is upon him to see that his own pipes, through which the gas is to be used, are in good order. "This duty," said the court, "is stronger and more direct upon him than upon the Company."

The Part Taken by the Indianapolis Gas Company in the Industrial Parade.

The "Industrial Parade" in Indianapolis, Ind., the 18th ult., was the greatest pageant of its kind ever witnessed in that city. One hundred and eighty business firms were represented with elaborate and comprehensive exhibits. It took over 3 hours for this immense parade to pass the reviewing stand.

The Indianapolis Gas Company had in the line a display extending a length equalling nearly four city blocks. Following the autos containing the officials and representatives of the Company, the first float, typifying a model kitchen and dining room was brilliantly and

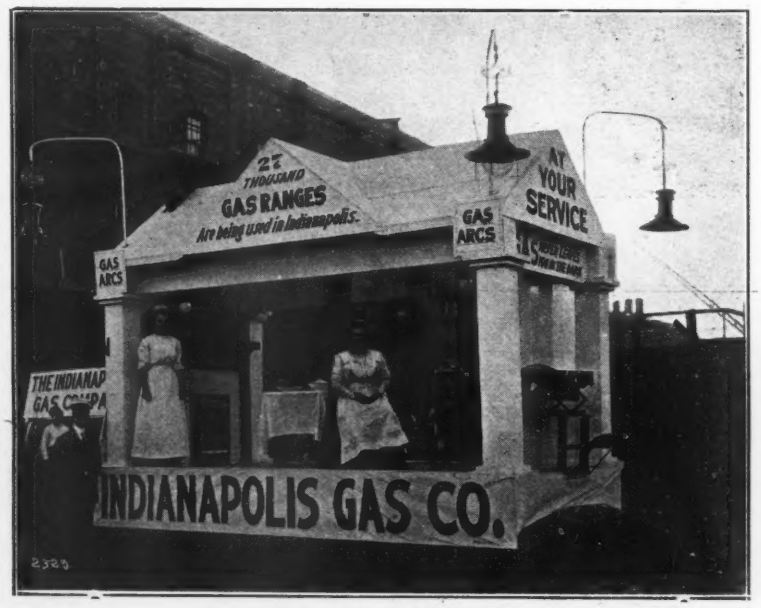


Fig. 1.—Kitchen and Dining Room.

successfully illuminated with Welsbach gas arcs and reflex lamps. The gas was supplied from the Company's Pintsch gas plant, in large compression tanks, under about 250 pounds pressure, and the lamps were suspended from anti-vibrators to prevent breakage of mantles along the line of march. All the lamps maintained a perfect light throughout the parade, although they were well jolted on some of the rougher parts of the streets. This incidentally emphasizes the value to gas companies of the anti-vibrator as a means of getting gas installations in factories and workshops where there is considerable jarring from machinery. The gas range and water heater in the kitchen and the fireplace cone heater in the dining room were demonstrated all along the line. Two other "floats" represented a modern

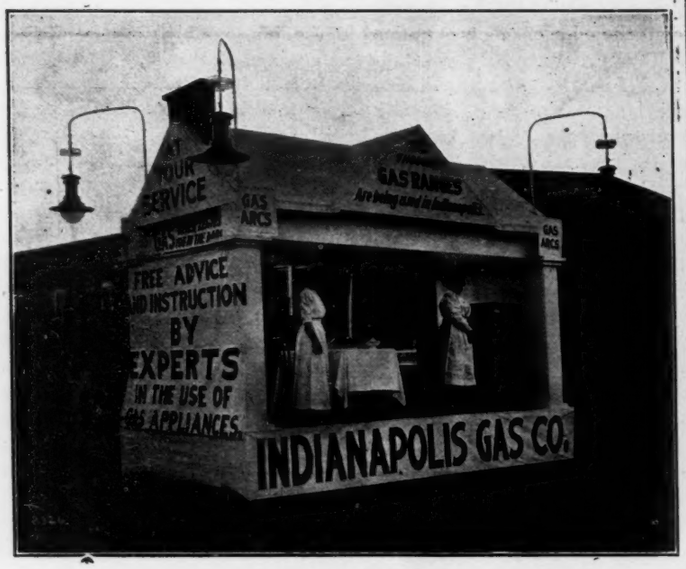

AT YOUR SERVICE
GAS RANGES
GAS ARCS
FREE ADVICE AND INSTRUCTION BY EXPERTS IN THE USE OF GAS APPLIANCES.
INDIANAPOLIS GAS CO.

Fig. 2.—Gas Kitchen.

YOUR COMPLAINTS RECEIVE PROMPT ATTENTION
INDIANAPOLIS GAS CO.
GAS METERS
THE INDIANAPOLIS GAS CO.
HAS SUPPLIED THE CITY WITH GAS
FOR OVER 50 YEARS.

Fig. 5.—The "White" Gas Meters.

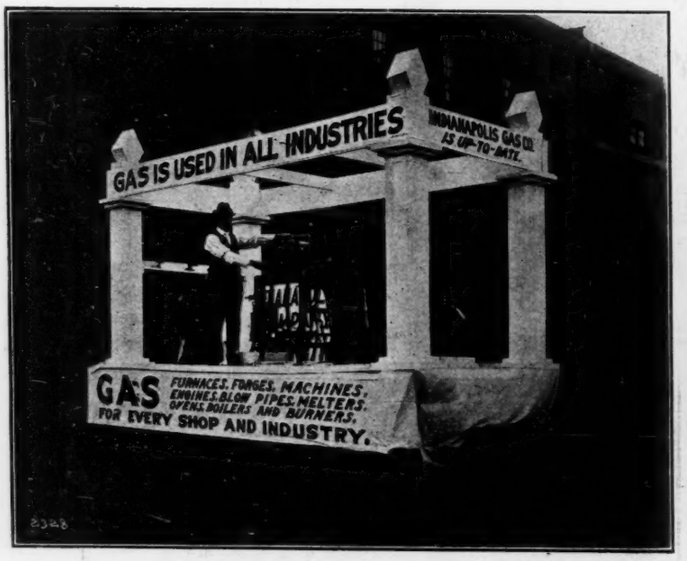

GAS IS USED IN ALL INDUSTRIES
INDIANAPOLIS GAS CO. IS UP-TO-DATE.
GAS FURNACES, FORGES, MACHINES, ENGINES, BLOW PIPES, MELTERS, OPENS, BOILERS AND BURNERS, FOR EVERY SHOP AND INDUSTRY.

Fig. 3.—Industrial Gas Appliances.

Fig 6.—Welsbach Lamps and Glassware.

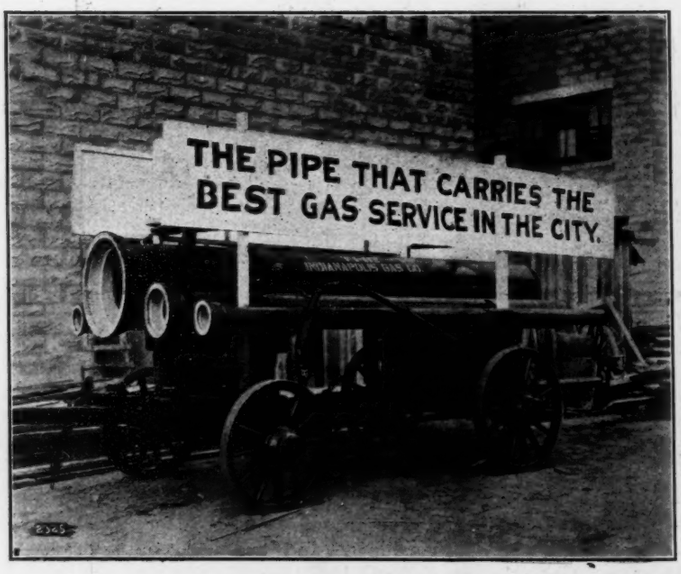


Fig. 4.—Pipe Wagon.

457 ORDERS for GAS HEATERS WERE RECEIVED IN ONE DAY By the INDIANAPOLIS GAS CO.
INDIANAPOLIS GAS CO.
GAS HEATERS and RADIATORS FOR RESIDENCES, OFFICES and STORES
The GAS CONSUMER'S WARMEST FRIENDS

Fig. 7.—Gas Heaters.

workshop with gas furnaces, forges and other industrial gas appliances in "flaming" operation, and an exhibit of the various sizes of gas meters, suggestively painted "white." Behind these there was a large float displaying Welsbach gas lights, domes, colored glassware, etc. This car was also successfully illuminated with Pintsch gas. Over 200 employees of the Company, in white caps, marched in line, each carrying a flag containing the adopted slogan, "At Your Service." Another 100 of these flags floated from the various automobiles, coke and pipe wagons, and other vehicles, all drivers of the teams wearing white uniforms. The Company's squad of motorcycles bore the signs, "Quick Service," while at intervals along the line, large box lanterns, 8 and 9 feet long, told the story of gas and good service.

The display closed with a float containing gas heaters and radiators, in which 50 concealed red lanterns advertised the comfort and cheerfulness of those seasonable gas appliances. The parade took place at night, and it was estimated that 150,000 people witnessed it. The photographs were necessarily taken during the daytime, when the floats were not completed and in operation.

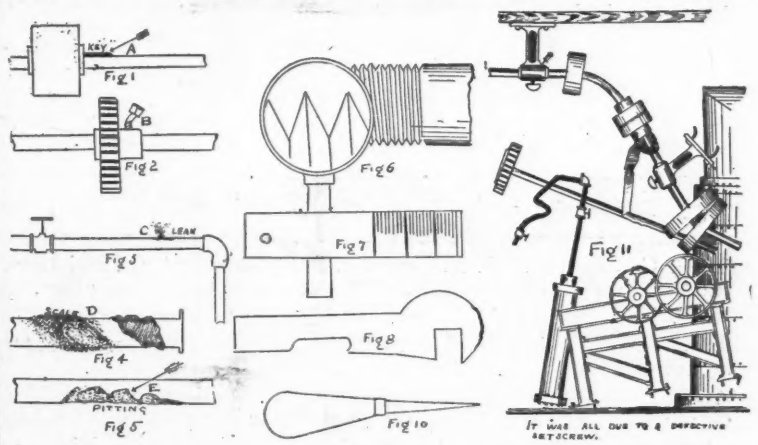
A Gas Plant Patrol.

[Prepared for the JOURNAL, by "R."]

An accident was averted in a gas plant because the patrol discovered that a key to one of the main driving pulleys was working free. The conditions are shown in Fig. 1, where the steel key *A* is protruding from the key-seat in the shaft and wheel-hub. The key was nearly out when observed. I notice that gas plant patrols are being formed with increasing frequency. In fact, the gas plant patrol, for the purpose of locating leaks in tanks or pipes, or other defects in any part of the machinery of the plant, is not a new institution. Inspecting parties have been in vogue in all gas manufacturing plants for a long time; but a regular system of patrol, for the purpose of locating conditions liable to lead to breakdowns or explosions, is now underway in numerous successful gas making plants. These patrols not only look out for defects in the plant liable to develop into breakdowns or accidents, but also observe anything liable to create waste. The patrol keeps his eye on the entire manufacturing situation, consequently the patrol of the modern gas works means something. In a large plant there might be several parties in the patrol, with a chief, one man undertaking the inspection and care of the mechanical end of the plant, another of the boiler plant, another of the tanks and pipes, and so on. In a plant of moderate size one man might attend to it all. I have sketched some of the factors that usually come in the way of the average patrol.

In one case the patrol saw that a set-screw was bent, as at *B*, Fig. 2. While this does not seem fraught with danger, the patrolman remembered that once, when a set-screw was bent like this, a workman caught the sleeve of his blouse on the head of the screw, through which contact he got a broken arm. In another case, the belt of the wheel slipping off, the bent head of the set-screw caught the belt, ripping it to pieces in the revolutions of the shaft. Again, a member of a patrol looks out for any leak, such, for illustration, as in Fig. 3, at *C*. Here is a light leakage due to a crack lengthwise in the pipe. It might be a water, steam or gas pipe. If gas, the gathering gas might result in an explosion. The patrol proceeds at once to report on the leak, or else go at it with tools and make the repair then and there. The members of the gas plant patrol also tell me that they catch many instances of incrusted tubes in the boilers, condensers and other places where tubes are used in gas plants. Fig. 4 is an example of the appearance of one tube thus discovered. In the event of a tube running like this for any length of time, the corroded sections will get impregnated and leakage will occur. The scale and corroded matter at *D* can be chipped off, if detected before the corrosive action of the material eats too deeply into the metal of the tube wall, thereby thinning and weakening it. The patrol not only detects the presence of exterior substances on pipes and tubes, but is on the lookout for pittings, as in Fig. 5, at *E*. Pitted tubes and pipes should be removed before damage results. If not detected, trouble of a serious character may arise. But with a good patrol system, in which one or more careful and trained men regularly inspect the pipes and tubes of the plant, there is not much liability of the pitting sinking too deeply into the metal before being detected.

The members of the patrol of some gas plants are equipped with special devices with which to work. In one gas plant the writer noticed that the patrolmen carried magnifying glasses. It seems an odd thing to do, but one party possessed a pair of common opera glasses and the results he obtained with these glasses were worth the while. He stood off in one end of a workroom, and, with the glasses spied the oilers of the hangers of the shafting, the belting, the gears of distant machines, the pipes of tanks in nooks and corners. It seemed a very simple way to make observations of possible defects. He could bring a leaking point down close to him where he could observe in detail. Another party carried a common pocket magnifying glass with him and with this glass, and the threads of a pipe or screw, as in Fig. 6, is able to enlarge the threads and note any defects in the same. If the threads are chipped, worn or broken, the patrolman can locate the position of the "imperfects" very quickly with the glass. For fine threadwork a glass of this kind is exceedingly useful. The glass can be used advantageously in examining fractures in pipes. It is a good plan to carry a small, steel, measuring rule, like that in Fig. 7, as you often have to make measurements in sizing up defects. The patrolman cannot burden himself with many tools and devices and get over the rounds very quickly; but he can carry a small, flat, key-wrench, of the type shown in Fig. 8. It is a good plan to carry something with a steel point to it, so as to pick into suspected places. A pointed tool, like that in Fig. 10, is a good one for this service. Fig. 11 shows a mass of wreckage which



was brought about when a defective set-screw caught a rapidly running leather belt. The belt, which was made to wind about the shaft, was strong and pulled up part of a small gasoline engine, and tangled the shafting in general, all of which might have been overcome if there had been a patrol inspection, for the patrol would have discovered the defective set-screw and fixed it before damage was done.

The Volatile Matter of Coal.

The heading is the title of the first bulletin to be issued by the new Federal Bureau of Mines. The authors, Messrs. Horace C. Porter and F. K. Ovitz, conducted their investigation at the Pittsburgh station, while it was under the Technologic Branch of the Geological Survey, the work being a continuation of the fuel investigations begun several years ago at the Louisiana Purchase Exposition, St. Louis, Mo. The results obtained at that plant showed the work of determining the fuel values of the coals and lignites in the United States, with a view to increasing efficiency in their utilization, would be incomplete if it did not include systematic physical and chemical researches into the processes of combustion. Hence in their later investigations the authors carried on such researches, concentrating attention on those lines of inquiry which promised results of greatest economic importance. This bulletin is, therefore, a report on an investigation of the volatile matter in several steam coals—its composition and amount at different temperatures of volatilization.

Quoted directly the authors say: "The investigation has already shown that the volatile content of different coals differs greatly in character. The volatile matter of the younger coals found in the West includes a large proportion of carbon dioxide, carbon monoxide, and water, and a correspondingly small proportion of hydrocarbons and tarry vapors. The older bituminous coals of the Appalachian region yield volatile matter containing large amounts of tarry vapors and hydrocarbons, difficult to burn completely without considerable excess of air and a high temperature. Coal of the Western type, moreover, gives up its volatile matter more easily at moderate and low temperatures than that of the other type. The volatile matter produced at medium and low temperatures is rich in higher hydrocarbons of the methane type, such as ethane and pro-

pane, which contains a larger proportion of carbon than is present in methane.

"These facts help to explain the difficulty of burning Pittsburgh coal, for example, without smoke, the low efficiency usually obtained in burning high volatile Western coals, the advantage of a preheated auxiliary air supply introduced over a fuel bed, and the advantage of a furnace and boiler setting adapted to the type of fuel used. They bear directly also on the question of steaming 'capacity' of coal for locomotives, the designing and operation of gas producers for high volatile fuels, and the operation of coke ovens and gas retorts.

"The results show further that certain bituminous coals of the interior and Rocky Mountain provinces give promise of good yields of by-products of coking, notably ammonia and high candle power gas, comparing favorably in these respects with the high grade coking coals of the Eastern provinces.

"They show also that inert, non-combustible material is present in the volatile products of different kinds of coal to an extent ranging from 1 to 15 per cent. of the coal."

The "Bulletin" will be of interest to fuel engineers, designers and builders of gas producers, gas and coke manufacturers, superintendents of power plants, railway master mechanics and those engaged in the suppression of smoke. It can be obtained by applying to the Director of the Bureau of Mines, Washington, D. C.

Recent Patent Issues.

Prepared for the AMERICAN GAS LIGHT JOURNAL by ROYAL E. BURNHAM, solicitor of patents and counselor in patent causes, 833 Bond Building, Washington, D. C., from whom illustrations and specifications of any patent mentioned below may be obtained for 10 cents.

973,498. Gas Burner. B. A. Geubink, East Cleveland, O., assignor to the Trenkamp Stove and Manufacturing Company, same place.

973,580. Incandescent Gas Lamp. E. H. Still, London, England.

973,626. Gas Washing Machine. W. H. Carrier, Buffalo, N. Y., assignor to Buffalo Forge Company, same place.

973,759. Means for Cleaning Gas Flues. W. B. Chapman, New York City, assignor to W. B. Hopping, trustees, same place.

973,950. Incandescent Gas Lamp. J. Maas, Kalamazoo, Mich., assignor to American Gas Light Company, same place.

973,971. Gas Lighting Appliance. M. Primeau and G. McCullagh, Winnipeg, Manitoba, Canada.

974,040. Gas Burner. W. Donley and C. Paul, Washington, Pa,; said Paul assignor to said Donley.

974,043. Machine for Discharging and Charging Gas Retorts or Coke Ovens. A. McD. Duckham, Little Bookham, England.

974,079. Drum Gas Meter. S. Kozminski, Charlottenburg, Germany, assignor to the firm of Vesta-Apparte and Metallwarenfabrik G.M.B.H., same place.

Items of Interest
FROM VARIOUS LOCALITIES.

THE veteran advocate of coke crushers in this country (Mr. C. M. Kellar, of Columbus, Ind.) is back from Europe after a sojourn of a year, spent in travelling and sightseeing. He looks well and feels well, and comes home able and willing to put an adjustable coke crusher in every gas works in the States that is not operating one.

A PAPER on the "Rotary Kiln," by Mr. Ellis Soper, of Detroit, will be read at the meeting this week in New York of the American Society of Mechanical Engineers, to be held in the Engineering Societies' Building, No. 29 West 39th street. Following this paper, Mr. Charles W. Baker, of the Editorial Staff of *Engineering News*, will give an illustrated lecture on the Panama Canal. The date of the meeting has been amended owing to the intervening of election day. Mr. Baker accompanied President Taft and the Board of Advisory Engineers appointed by the President on a trip to the canal zone and is thoroughly familiar with the present status of the canal work. The lecture will be illustrated by lantern slides made from photographs taken by Mr. Baker during the trip.

A MEETING for the organization of the Furnace Gas Consumer Company was held in the premises of the Republican Club, No. 39 West 40th street, New York, some days ago. Fifteen gentlemen (the Directors of the corporation), having put away a dinner prepared by the Club's caterers, as a preliminary to the main purpose of the gathering, proceeded to effect a permanent organization, with the following result: President and Treasurer, Mr. John H. Lynch; Vice-President, Mr. Wm. J. Paul; Secretary, Mr. Jos. G. Meyer; Assistant Secretary, Mr. L. W. Stotesbury. The meeting was certainly an enthusiastic one, good cause for such enthusiasm being found in the number of those who were applying for installations of the system. Notably in the list was one from those in charge of the Pennsylvania Railroad station at 34th street. Construction work on a practical scale will be commenced forthwith.

MANY interesting facts were made public after their narration by President James L. Richards, of the Boston Consolidated Gas Companies, on the occasion of the first fall meeting of the Company's heads of departments, which meeting was held the last week in October. As a result of improved facilities at Everett, he said, which include the erection of a new trestle and the purchase of a locomotive train, the 20,000 tons of coke which have been handled this fall cost only $.0263 a ton to handle, hardly a 10th of the cost of $.253 a ton last year. By the installation of a water gas set at Everett, that station is now enabled to turn out 15,000,000 cubic feet of gas a day. Although no gas was made at the Commercial Point and Bay State stations during the past year, both plants are in good condition, and within 24 hours could turn out 12,000,000 cubic feet of water gas. As soon as the heats could be obtained, 2,000,000 additional cubic feet of coal gas a day could be generated. During the past year 118,963 feet, or about 23 miles of gas mains were laid. There was a net gain of 1,630 services and 6,436 meters as compared with 1,289 services and 3,800 meters the preceding year. The output of gas was 5,190,631,000 cubic feet, an increase of about 5 per cent over the 4,948,378,000 cubic feet of last year. The distribution department showed expenses for the year ending June 30, 1910, of 361,445 or $2,770 lesss than in the year ending June 30, 1907, although 18 per cent. more was distributed than in 1907. The jobbing department executed 182,567 orders as against 180,200 the previous year, and furnished gratis 63,216 new burners. The total number of employees of the various companies is given as 2,592. The companies have 698 profit shares, whose inventments amount to $168,650.25. "During the past year," Mr. Richards said. "the Consolidated disposed of its electrical business and plants to the Edison Electric Company, and at the same time purchased the gas business of the Newton and Watertown Gas Light Company and the Waltham Company, effecting consolidation with them. The price of gas was reduced, on January 1, 5 cents per 1,000 in the territory served by the new Consolidated company. At the same time the Chelsea Company disposed of its electrical business, and the gas business of that Company was consolidated with that of the East Boston Gas Company. On January 1 last the new Consolidated Company reduced the price of gas in the Chelsea Company 5 cents and in the East Boston territory 10 cents per 1,000."

IN the suit brought by Mr. John W. Vreeland, Official Gas Inspector for Louisville, Ky., which proceeding was brought by complainant through an averment that he was legally entitled to a salary per year of $3,500, instead of $1,800, which the Louisville officials declared was a proper salary, the case was finished last week in the Court of Appeals, and Mr. Vreeland's contention is disallowed. In part, the Court said: "The Legislature, in enacting this provision [the Legislature gave the Mayor the right to appoint or remove the Inspector, with the consent of the Council], had in mind the city government as then constituted, and the salary ordinance pursuant under which its officers and employees were paid. There was no intention on the part of the Legislature to fasten upon the city an official beyond legislative controls when a new city government was formulated.

MR. MORGAN MORGANS has resigned the post of General Manager of the Chattanooga (Tenn.) Gas Company, to associate himself with a large industrial house in the North. His successor is Mr. H. W. Frund, of Salisbury, N. C., who has been acting as local Manager of the Dean syndicate properties in Salisbury.

THE official tests made by Inspector Tyler, regarding the thermal value of the gas supplied by the Lincoln (Neb.) Gas and Electric Light Company, for the year ended the 19th ult., averaged 631.7 thermal heat units.

CERTAIN residents of Freeport, Long Island, N. Y., have made formal complaint to the Public Service Commission, Second District, alleging that respeated applications to the proprietors of the Nassau and Suffolk Lighting Company, for certain main extensions, have been promised, but no sign of performance thereof or thereon has been made. It is further asserted that the number of prospective users of gas along the tentative main lines is well beyond that required by the Commission in germane cases.

AT the annual meeting of the Springfield (Mass.) Gas Light Company the annual reports respecting the Company's operations for the twelvemonth were of an eminently satisfactory nature. In the election for Directors the gentlemen now named were chosen: C. L. Goodline, Chas. H. Tenney, Fred. H. Harris, Albert B. Tenney, Wm. G. Wheat, B. E. Helm, Horace Wood, Samuel York, E. M. Bradley and H. C. Warren. The Directors subsequently named the following executive management: President, C. H. Tenney; 1st Vice-President, A. P. Tenney; 2d Vice-President, D. Edgar Manson; Treasurer,

Eugene Milliken; Assistant Treasurer, W. H. Bradley; Clerk, Horace Wood.

MR. J. P. CURRY has been appointed Manager of the Sharon (Pa.) Gas Company. For some years Mr. Curry was in charge of the plant at Dubois, Pa.

THE Baltimore (Md.) Retort and Firebrick Company has just issued "Pamphlet No. 2," covering the firebrick boiler settings which it manufactures. Gas engineers will find much of interest in the various tables and general data given. In view of the worth of the compilation it is fair to note that Manager Rancke will need to have many copies of "No. 2" on hand, if his Company proposes to fill the sight-drafts that will be made for the compilation in question.

MR. FRED. C. BUTLER, the watchful Superintendent of the Greenfield (Mass.) Gas Light Company, is no longer alone. The change came to him about a fortnight ago, when Miss Minnie Pearson, of Meredith, N. H., told the officiating minister Mr. Butler was the party of the first part.

THE members of the Chemical Class, Manual Training High School, Indianapolis, Ind., recently made a visit of inspection to and through the works of the Indianapolis Gas Company. They were 20 in number, were under the guidance of their instructor (Mr. C. A. Vallance), and were the especial guests of General Manager C. H. Graf.

MR. HENRY LOUX has been chosen Manager of the Fidelity Gas Company, of Hoosick Falls, N. Y., vice Mr. F. A. Woodhead, who was recently appointed to a responsible position on the staff of the Brooklyn Union (N. Y.) Gas Company. Mr. Loux has been in the service of the Fidelity Company since 1896.

ANOTHER of the "triumphs" of the blatant demagogues, whose assaults against the properties and rights of the Gas Companies of New York city were at their zenith in 1905, has been pnnctured. This time the scene was laid in the Appellate Division of the New York Supreme Court, and the cause of the farce was the city of New York, whose legal figurehead asked for a permanent injunction against the Mutual Gas Light Company, restraining it from maintaining its mains and pipes, and ordering the Company to apply for a new franchise as well as to account to the city for damages. The city contended that the Company, which secured a franchise from the State in 1866, was permitted, per a resolution of the Board of Aldermen in 1868, to lay pipes and mains for a period of only 30 years. The city further contends that, in consequence of this lapse, the Company had been maintaining a nuisance since 1898. The Company's rejoinder was that it had been engaged in business without hindrance for 40 years, during which time it had observed all the obligations of its franchise. The court, in ordering the case dismissed, declared that the franchise, under which legislative grant the Company has been operating, is perpetual, and so the Company requires no secondary franchise from the city. Further, any limitation, to 30 years or other period named in a city assent, is completely inoperative.

UNDER the plan, prepared by the city authorities of Chicago, to determine what shall be a fair price for gas in that city, after February 25, 1911, it has been arranged to proceed along systematically smooth lines. In the first place, a complete appraisal of all the properties of the Peoples Gas Light and Coke Company is to be made, the investigation to be carried out by the Councilmanic Committee on Gas, Oil and Electric Lights, Ald. W. J. Pringle, Chairman. A conference between the Company and the officials was held recently, and the former agreed to give the investigators full access to its buildings and books, with unhampered authority to investigate all its equipment. It was determined that the examination should be minute in detail, so that the cost of reproducing the plant could be determined, as well as the present physical value thereof. To determine the cost of manufacture, distribution and sale, with all the charges accompanying these branches of the business, the Company's operating accounts will be analyzed and the vouchers for a period of years will be examined. The income statement will be checked with the customers' accounts. To facilitate this work a room in the Company's offices will be set aside for the use of Expert Hagenah and his corps of assistants. It is hoped that a start will be made on this work early the current month.

WE are indebted to the courtesy of Mr. J. G. Bainbridge, Secretary of the Stevens Engineering Society, the headquarters of which body are in Castle Point, Hoboken, N. J. (it is also affiliated with the Am. Society Mechanical Engineers), for a roster of the Lecture Course of the Society, season 1910-11. These lectures last year attracted much attention, although the listed subjects were neither as numerous nor as popular, from the general listener's standpoint as are those listed for the current season. The lectures are 15 in number, and the subjects, together with the fame of their preparers, are of sufficient importance to warrant a reproduction of the main particulars of the course, to the end that such featuring may induce some of the junior fraternity in this section to attend them. Two of these have already been given, the first on October 18th, by Dr. Alexander C. Humphreys, on "Membership in Engineering Societies," and last Tuesday the second, Irving E. Moultrop, M.E., on the "Design and Construction of a Central Power Station. Both these lectures were largely attended, and the introductory number was a gem. The balance of the series is:

Date.	Speaker.	Subject.
Nov. 15	J. P. Haney, B.S., etc.	"Art and the Engineer."
Nov. 22	D. B. Maxmillan, A.B	"With Peary in the Arctic."
Nov. 29	H. W. Wiley, M.D., etc.	"The Services of Chemistry in the Promotion of the Public Welfare."
Dec. 6	R. W. Raymond, Ph.D., etc.	"The story of an Island."
Dec. 20	David T. Day, Ph.D	"The Origin of Petroleum."
Jan. 10	G. F. Williams, E.M., etc.	"The Kimberley Diamond Mines."
Feb. 14	Carl Hering, M.E.	"The Electric Furnaces."
Feb. 20	F. H. Newell, B.S.	"Reclamation."
Mch. 7	Wm. Campbell, Sc.D., etc.	"Metallography as applied to Engineering."
Mch. 21	A. S. McKenzie	"Radioactive Phenomena."
April 4	Geo. E. Hulse, M.E.	"Illuminating Engineering."

TOWARDS the close of last month a special meeting of the shareholders of the Westbrook (Me.) Gas Company was held for the purpose of accepting or rejecting an Act of the Legislature, entitled "An act to amend and extend the charter of the Westbrook Gas Company." The privilege was accepted by unanimous vote, and it was also then and there decided to increase the Company's capital stock to $150,000—the original capitalization was $10,000.

THE special election, held in Daytona, Fla., to determine whether or not Mr. Homer J. Smith and associates would be satisfactory to the votes of the residents, resulted in an indorsement of the project for a gas works. It is worthy of note that the day set apart for the voting was marked by one of the most violent electrical disturbance storms that ever visited Daytona, so far as the records of any predecessors of like nature show.

THE proprietors of the Springfield (Mass.) Gas Light Company announce that, beginning January 1, 1911, a concession of 5 cents per 1,000 cubic feet will become operative in respect of the net selling rate. The gross remains at $1, and the discount figure (operative through prompt payment) is increased to 15 cents per 1,000. This, of course, means 85-cent gas for Springfield on January 1st.

THE Baltimore Consolidated Gas, Electric Light and Power Company has purchased a large tract of land in the West Arlington district, whereon will be constructed a storage warehouse for the better containing of the goods necessary to the continued development of its commercial division—ranges, water heaters, etc.

AMONGST the recent incorporations at Dover, Del., the formation of the American Light, Heat and Power Company is noted. It is capitalized in $15,000,000, and the incorporators are Messrs. Warren N. Akers, Wm. J. Maloney and Millard J. Taylor, all of Wilmington.

THE Supervisors of Nether Providence, Pa., have entered into a contract with the Philadelphia Suburban Gas and Electric Company for the maintenance of 60 additional gas lamps of the Welsbach improved type. The main system to sustain these lamps will go through Chester township, which arrangement will permit the residents of the intervening settlement of Brookhaven to enjoy the benefits of gas on its many useful accounts.

IN the reorganization of the Flint (Mich.) Gas Company, which was perfected the last week in October, the following executives were named: Directors, J. C. Wilson, A. G. Bishop, R. J. Whaley, C. A. Cummings, J. J. Carton, C. M. Begole and H. M. Eaton, of Flint; W. H. Barthold, of Detroit; and H. D. Walbridge, of New York; President, H. D. Walbridge; First Vice-President and Chairman Board of Dieectors, J. C. Willson; Second Vice-President, W. H. Barthold; Secretary, J. D. Cameron; Treasurer and General Manager, H. M. Eaton.

UNDER the agreement between the Consolidated Gas Company, of Charleston, S. C., and the construction division of the United Gas Improvement Company, the new water gas sets will be ready for gas making not later than January 15. Mr. Waring is surely and safely hustling things along in his section of the Ca♀linas,

PROF. E. E. BEMIS no longer serves the city of New York in any official capacity, having been removed, by order of Commissioner Henry S. Thompson, from the position of Deputy Commissioner, Department of Water Supply, Gas and Electricity. He refused to resign. *Pace tanti viri!*

THE AMERICAN GAS LIGHT JOURNAL

A. M. CALLENDER & CO.,
PROPRIETORS.

THOS. J. CUNNINGHAM,
ELBERT P. CALLENDER,
EDITORS.

CHARLES H. WADELTON,
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MONDAY, NOVEMBER 7, 1910.

The Market for Gas Securities.

There is not much to write about concerning the week's history of the gas share market, although whatever history was made therein was the record of at least steady prices. The trading was light (especially in respect of Consolidated), but the undertone was decidedly firmer. Consolidated came in this morning (Friday) at 138 to 138¼, and the indications certainly seem to favor a continuance of the advance through the afternoon.

Brooklyn Union is steady, and in connection with that corporation we note with sorrow the death of its President, Gen. James Jourdan, to whose cleveness the Brooklyn Union owes much of its present financial standing. His entrance into the gas business was made at a peculiar time, when gas conditions iu Brooklyn wore a decidedly odd complexion. And the writer believes he is justified in writing that no other man in Brooklyn could have brought back to lusty health the puny gas infant known as the Fulton-Municipal Gas Company with such success to its promoters. The outside gas share market is dull and steady.

Gas Stocks.

Quotations by George W. Close, Broker and Dealer in Gas Stocks.

115 BROADWAY, NEW YORK CITY.

NOVEMBER 7.

☞ All communications will receive particular attention.

☞ The following quotations are based on the par value of $100 per share:

N. Y. City Companies.	*Capital.*	*Par.*	*Bid.*	*Asked*
Consolidated Gas Co.	$78,177,000	100	138	138¼
Central Union Gas Co.— 1st 5's, due 1972, J. & J.	3,000,000	1,000	98	101
Equitable Gas Light Co.— Con. 5's, due 1932, M. & S.	1,000,000	1,000	—	105
Mutual Gas Co.	3,600,000	100	155	165
New Amsterdam Gas Co.— 1st Con. 5's, due 1948, J. & J.	11,000,000	1,000	100	101½
New York & Richmond Gas Co. (Staten Island)	1,500,000	100	35	50
1st Mtg. Gold Bds. 5 p. ct.	1,000,000	—	98¼	100¼
New York and East River— 1st 5's, due 1944, J. & J.	3,500,000	1,000	104	107
Con. 5's, due 1945, J. & J.	500,000	—	97	101
Northern Union— 1st 5's, due 1927, J. & J.	1,250,000	1,000	94	100
Standard	5,000,000	100	—	75
Preferred	5,000,000	100	70	100
1st Mtg. 5's, due 1930, M. & N.	1,500,000	1,000	100	105
The Brooklyn Union	15,000,000	1,000	136	137½
1st Con. 5's, due 1948, M. & N.	15,000,000	—	106¼	107
Yonkers	299,650	500	130	—
Out-of-Town Companies.				
Bay State	50,000,000	50	⅝	¾
" Income Bonds	2,000,000	1,000	—	75
Binghampton Gas Works	450,000	100	—	65
" 1st Mtg. 5's	500,000	1,000	90	96
Boston United Gas Co.— 1st Series S. F. Trust	7,000,000	1,000	82	85
2d " " "	3,000,000	1,000	47½	50
Buffalo City Gas Co.	5,500,000	100	5	8
Bonds, 5's	5,250,000	1,000	73	73½
Capital, Sacramento	500,000	50	—	35
Bonds (6's)	150,000	1,000	—	—
Chicago Gas Co. Guaranteed Gold Bonds	7,660,000	1,000	104	106¼
Cincinnati Gas and Electric Co.	29,500,000	100	92	93
Columbus (O.) Gas Co., 1st Mortgage Bonds	1,500,000	1,000	96	98
Columbus (O.) Gas Lt. & Heating Co.	1,682,750	100	90½	91
Preferred	3,026,500	100	75½	80
Consumers, Toronto	2,000,000	50	200	204
Consolidated, Baltimore	11,000,000	100	106½	—
Mortgages, 6's	3,600,000		89	100
Chesapeake, 1st 6's	1,000,000	—	—	—
Equitable, 1st 6's	910,000	—	—	—
Consolidated, 1st 5's	1,490,000	—	—	112
Consolidated Gas Co. of N. J.	1,000,000	100	15	17
Con. Mtg. 5's	880,000	1,000	92	95
Bonds	75,000	—	—	100
Denver Gas and Electric	3,500,000	—	102	105
Detroit City Gas Co	5,000,000	50	—	50
" Prior Lien 5's	4,619,000	1,000	97	100½
Detroit Gas Co., 5's	331,000	1,000	75	80
Equitable Gas & Fuel Co., Chicago, Bonds	2,000,000	1,000	—	101
Essex and Hudson Gas Co.	6,500,000	—	39	40
Fort Wayne	2,000,000	—	—	—
" Bonds	2,000,000	—	55	—
Grand Rapids Gas Light Co., 1st Mtg. 5's	1,225,000	1,000	104½	105
Hartford	750,000	25	190	200
Hudson County Gas Co., of New Jersey	10,500,000	—	112	113½
" Bonds, 5's	10,500,000	—	108	108½
Indianapolis	2,000,000	—	60	70
" Bonds, 5's	2,650,000	—	104½	105
Jackson Gas Co.	250,000	50	82	—
" 1st Mtg. 5's	290,000	1,000	97	100
Kansas City Gas Light Co., of Missouri	5,000,000	100	—	36
Bonds, 1st 5's	3,822,000	1,000	102	104
Laclede Gas Co., St. Louis.	10,000,000	100	105	105¼
Preferred	2,500,000	100	94	102
Bonds	10,000,000	1,000	102½	103
Lafayette Gas Co., Ind.	1,000,000	100	—	60
Bonds	1,000,000	1,000	60	65
Louisville	2,570,000	50	143	145
Madison Gas and Electric Co. " 1st Mtg. 6's	350,000	1,000	106	108¾
" 6 per cent. scrip, due 1910	100,000	25	60	60½
Massachusetts Gas Companies, of Boston	25,000,000	100	89⅛	89¾
Preferred	25,000,000	100	94	95
Montreal Gas Co., Canada	2,000,000	100	218	218¾
Nashville Gas Light Co.	1,000,000	100	110	—
Newark, N. J., Con. Gas Co.	6,000,000	—	56	58
Bonds, 6's	6,000,000	—	137	138
New Haven Gas Co.	2,000,000	25	200	—
Peoples Gas Lt. & Coke Co., Chicago	25,000,000	100	107	107¼
1st Mortgage	20,100,000	1,000	—	—
2d "	2,500,000	1,000	104	—
Rochester Gas & Electric Co.	2,150,000	50	88	—
Preferred	2,150,000	50	118	--
Consolidated 5's	2,000,000	—	104⅛	105½
San Francisco Gas Co., Cal.	15,500,000	—	—	—
St. Joseph Gas Co.— 1st Mtg. 5's	751,000	1,000	100	102
St. Paul Gas Light Co.	1,500,000	100	45	47
1st Mortgages, 6's	650,000	1,000	113	116
Extension, 6's	600,000	1,000	112½	115
General Mortgage, 5's	2,465,000	1,000	90	95
Syracuse Gas Co., N. Y.	1,975,000	100	50	55
Bonds	2,047,000	1,000	100	104
Washington (D. C.) Gas Co.	1,800,000	200	382½	385
1st Mortgage, 6's	600,000	—	—	—
Western Gas Co., Milwaukee	4,000,000	—	—	—
Wilmington (Del.) Gas Co.	600,000	50	361	—

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New advertising, or changes in standing ads., to assure attention the issue following their reception, must be in hand on Wednesday.

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Riter-Conley Mfg. Co., Pittsburgh, Pa..... 883
The Stacey Mfg. Co., Cincinnati, O..... 907
Western Gas Construction Co., Fort Wayne, Ind..... 912

GAS MAIN STOPPERS.

Safety Gas Main Stopper Co., New York City..... 903

GAS METER CONNECTIONS.

H. Mueller Manufacturing Co., Decatur, Ills..... 897

GAS METERS.

American Meter Co., New York and Philadelphia..... 911
D. McDonald & Co., Albany, N. Y..... 909
Helme & McIlhenny, Philadelphia, Pa..... 911
John J. Griffin & Co., Philadelphia, Pa..... 864
Keystone Meter Co., Royersford, Pa..... 910
Maryland Meter and Mfg. Co., Baltimore, Md..... 910
Metric Metal Works, Erie, Pa..... 911
Nathaniel Tufts Meter Co., Boston, Mass..... 910
New York Improved Meter Co., New York City..... 894
Pittsburg Meter Co., East Pittsburg, Pa..... 894
Rotary Meter Co., New York City..... 909
Sprague Meter Co., Bridgeport, Conn..... 909

GAS PLANT TOOLS.

H. Mueller Manufacturing Co., Decatur, Ills..... 897

GAS STOVES.

American Meter Co., New York and Philadelphia..... 911
Keystone Meter Co., Royersford, Pa..... 910
Maryland Meter & Manufacturing Co., Baltimore, Md... 910
Nathaniel Tufts Meter Co., Boston, Mass..... 910

GAS TAPPING MACHINES.

George Light, Dayton, O..... 903
H. Mueller Manufacturing Co., Decatur, Ills..... 897

GAS WORKS APPARATUS AND CONSTRUCTION.

Bartlett-Hayward Co., Baltimore, Md..... 905
Connelly Iron Sponge & Governor New Co., York City. 908
Cruse-Kemper Co., Ambler, Pa..... 892
Davis & Farnum Mfg. Co., Waltham, Mass..... 904
Deily & Fowler Mfg. Co., Philadelphia, Pa..... 906
Evens & Howard Firebrick Co., St. Louis, Mo..... 839
Fred Bredel Co., Milwaukee, Wis..... 907
Gas Engineering Co., Trenton, N. J.. 848
Humphreys & Glasgow, New York City..... 904
Improved Equipment Company, New York City..... 885
Isbell-Porter Co., New York City..... 891
Kerr Murray Mfg. Co., Fort Wayne, Ind..... 902
Laclede-Christy Clay Products Co., St. Louis, Mo..... 890
Lloyd Construction Co., Detroit, Mich..... 888
Quintard Iron Works Co., New York City..... 893
R. D. Wood & Co., Philadelphia, Pa..... 910
Riter-Conley Mfg. Co., Pittsburgh, Pa..... 883
The Gas Machinery Co., Cleveland, O..... 887
The Stacey Mfg. Co., Cincinnati, O..... 907
The United Gas Improvement Co., Philadelphia, Pa... 899
Western Gas Construction Co., Fort Wayne, Ind..... 912

HIGH PRESSURE GAS GOODS.

H. Mueller Manufacturing Co., Decatur, Ills..... 897

HOT WATER HEATERS.

Humphrey Co., Kalamazoo, Mich..... 888

INCANDESCENT GAS LAMPS.

American Gas Light Co., Kalamazoo, Mich..... 884
General Gas Light Co., Kalamazoo, Mich..... 889
Welsbach Company, Gloucester, N. J..... 898

INCLINED RETORTS.

Baltimore Retort and Firebrick Co., Baltimore, Md... 900
Didier-March Co., New York City..... 907
Evens & Howard Firebrick Co., St. Louis, Mo..... 839
Fred Bredel Co., Milwaukee, Wis..... 907
Gas Bench Construction Co., St. Louis, Mo..... 893
Improved Equipment Company, New York City..... 885
Laclede-Christy Clay Products Co., St. Louis, Mo..... 890
Parker-Russell Mining and Mfg. Co., St. Louis, Mo... 900

MAIN AND SERVICE LAYING.

Sullivan Bros., Flushing, N. Y..... 903

PATENTS, TRADE-MARKS & COPYRIGHTS

Royal E. Burnham, Washington, D. C..... 903

PIPE LINE TOOLS.

H. Mueller Manufacturing Co., Decatur, Ills..... 897

PREPAYMENT METER ATTACHMENTS.

New York Improved Meter Co., New York City..... 894

PREPAYMENT METERS.

American Meter Co., New York and Philadelphia..... 911
D. McDonald & Co., Albany, N. Y..... 909
Helme & McIlhenny, Philadelphia, Pa..... 911
John J. Griffin & Co., Philadelphia, Pa..... 864
Keystone Meter Co., Royersford, Pa..... 910
Nathaniel Tufts Meter Co., Boston, Mass..... 910
New York Improved Meter Co. New York City 9 0
Pittsburg Meter Co., East Pittsburg, Pa..... 894
Sprague Meter Co., Bridgeport, Conn..... 909

PROCESSES.

Bartlett-Hayward Co., Baltimore, Md..... 905
Fred Bredel Co., Milwaukee, Wis..... 907
Humphreys & Glasgow, New York City..... 904
Improved Equipment Company, New York City..... 885
The Gas Machinery Co., Cleveland, O..... 887
The United Gas Improvement Co., Philadelphia, Pa... 899
Western Gas Construction Co., Fort Wayne, Ind..... 912

PRODUCER POWER PLANTS.

R. D. Wood & Co., Philadelphia, Pa..... 910

PURIFIER AND SCRUBBER TRAYS.

Bartlett-Hayward Co., Baltimore, Md..... 905
Cabot Mfg. Co., Hoboken, N. J..... 903
Western Gas Construction Co., Fort Wayne, Ind..... 912

PURIFIERS.

Bartlett-Hayward & Co., Baltimore, Md..... 905
Connelly Iron Sponge & Governor Co., New York City. 901
Cruse-Kemper Co., Ambler, Pa..... 892
Davis & Farnum Mfg. Co., Waltham, Mass..... 904
Evens & Howard Firebrick Co., St. Louis, Mo..... 839
Isbell-Porter Co., Newark, N. J..... 891
Kerr Murray Mfg. Co., Fort Wayne, Ind..... 902
Quintard Iron Works, New York City..... 893
R. D. Wood & Co., Philadelphia, Pa..... 910
The Gas Machinery Co., Cleveland, O..... 887
The Stacey Mfg. Co., Cincinnati, O 907
The United Gas Improvement Co., Philadelphia, Pa... 890
Western Gas Construction Co., Fort Wayne, Ind..... 912

PURIFYING MATERIALS.

Connelly Iron Sponge & Governor Co., New York City 901
The United Gas Improvement Co., Philadelphia, Pa... 899

REGENERATIVE FURNACES.

Baltimore Retort and Firebrick Co., Baltimore, Md.. 900
Bartlett, Hayward & Co., Baltimore, Md..... 905
Didier-March Co., New York City..... 906
Evens & Howard Firebrick Co., St. Louis, Mo..... 839
Fred Bredel Co., Milwaukee, Wis..... 907
Gas Bench Construction Co., St. Louis, Mo..... 893
Improved Equipment Company, New York City..... 885
J. H. Gautier & Co., Jersey City, N. J..... 900
Laclede-Christy Clay Products Co., St. Louis, Mo..... 890
Missouri Firebrick Co., St. Louis, Mo..... 900
Parker-Russell Mining and Mfg. Co., St. Louis, Mo.... 900

RETORTS AND FIREBRICKS.

Baltimore Retort and Firebrick Co., Baltimore, Md... 900
Didier-March Co., New York City..... 906
Evens & Howard Firebrick Co., St. Louis, Mo..... 839
Fred Bredel Co., Milwaukee, Wis..... 907
Gas Bench Construction Co., St. Louis, Mo..... 893
Henry Maurer & Son, New York City..... 893
Improved Equipment Company, New York City..... 885
James Gardner, Jr., Co., Bolivar, Pa..... 888
J. H. Gautier & Co., Jersey City, N. J..... 900
Laclede-Christy Clay Products Co., St. Louis, Mo..... 890
Missouri Firebrick Co., St. Louis, Mo..... 900
Parker-Russell Mining and Mfg. Co., St. Louis, Mo.... 900

RUBBER GOODS.

New York Rubber Co., New York City..... 888

SCRUBBERS AND CONDENSERS.

Bartlett-Hayward Co., Baltimore, Md..... 905
Cruse-Kemper Co., Amler, Pa..... 892
Davis & Farnum Mfg. Co., Waltham, Mass..... 904
Evens & Howard Firebrick Co., St. Louis, Mo..... 839
Fred Bredel Co., Milwaukee, Wis..... 907
Isbell-Porter Co., Newark, N. J..... 891
Kerr Murray Mfg. Co., Fort Wayne, Ind..... 902
Quintard Iron Works, New York City..... 893
R. D. Wood & Co., Philadelphia, Pa..... 910
Riter-Conley Mfg. Co., Pittsburgh, Pa..... 883
The Gas Machinery Co., Cleveland, O..... 887
The Stacey Mfg. Co., Cincinnati, O..... 907
The United Gas Improvement Co., Philadelphia, Pa... 889
Western Gas Construction Co., Fort Wayne, Ind..... 912

SELF-SEALING MOUTHPIECE DOORS.

Bartlett-Hayward Co., Baltimore, Md..... 905
Davis & Farnum Mfg. Co., Waltham, Mass..... 904
Fred Bredel Co., Milwaukee, Wis..... 907
Isbell-Porter Co., Newark, N. J..... 891
Improved Equipment Company, New York City..... 885
Kerr Murray Mfg. Co., Fort Wayne, Ind..... 902
Parker-Russell Mining and Mfg. Co., St. Louis, Mo..... 900
Quintard Iron Works, New York City..... 893
R. D. Wood & Co., Philadelphia, Pa..... 910
The Gas Machinery Co., Cleveland, O..... 887
The Stacey Mfg. Co., Cincinnati, O..... 907
Western Gas Construction Co., Fort Wayne, Ind..... 912

STOKING MACHINERY.

Fred Bredel Co., Milwaukee, Wis..... 907
G. A. Bronder, New York City..... 901
Laclede-Christy Clay Products Co., St. Louis, Mo..... 880
Parker-Russell Mining and Mfg. Co., St. Louis, Mo. ... 890

STORAGE TANKS.

Bartlett-Hayward Co., Baltimore, Md..... 905
Davis & Farnum Mfg. Co., Waltham, Mass..... 904
Quintard Iron Works, New York City..... 893
The Stacey Mfg. Co., Cincinnati, O..... 907
Western Gas Construction Co., Fort Wayne, Ind..... 912

STREET LAMPS.

Thos. T. W. Miner, New York City..... 890
Welsbach Street Lighting Co., New York and Phila.. 898

TAR AND CARBONIC ACID EXTRACTOR.

Bartlett-Hayward Co., Baltimore, Md..... 905
Fred Bredel Co., Milwaukee, Wis..... 907
Isbell-Porter Co., Newark, N. J..... 891
Kerr Murray Mfg. Co., Fort Wayne, Ind..... 902
The Gas Machinery Co., Cleveland, O..... 887
The Stacey Mfg. Co., Cincinnati, O..... 907
The United Gas Improvement Co., Philadelphia, Pa... 899
Western Gas Construction Co., Fort Wayne, Ind..... 912

VALVES.

Bartlett-Hayward & Co., Baltimore, Md..... 905
Davis & Farnum Mfg. Co., Waltham, Mass..... 904
Isbell-Porter Co., Newark, N. J..... 891
Kerr Murray Mfg. Co., Fort Wayne, Ind..... 902
Ludlow Valve Manufacturing Co., Troy, N. Y..... 893
R. D. Wood & Co., Philadelphia, Pa..... 910
The Gas Machinery Co., Cleveland, O..... 887
The P. H. & F. M. Roots Co., Connersville, Ind..... 895
The Stacey Mfg. Co., Cincinnati, O..... 907
Western Gas Construction Co., Fort Wayne, Ind..... 912

VERTICAL S'S.

Connelly Iron Sponge & Gov. Co. (Drake's [Eng.] System) 901
Didier-March Co., New York City..... 906
Evens & Howard Firebrick Co , St. Louis, Mo..... 839
Fred Bredel Co., Milwaukee, Wis..... 907
Gas Bench Construction Co., St. Louis, Mo..... 893
Improved Equipment Company, New York City..... 885
Laclede-Christy Clay Products Co., St. Louis, Mo..... 890
Parker-Russell Mining and Mfg. Co., St. Louis, Mo. .. 900

WATER METERS.

Pittsburg Meter Co., East Pittsburg, Pa..... 894

Utilize Your Gas Liquor.
NO EXTRA LABOR OR OPERATING EXPENSES.
IMPROVED AMMONIA CONCENTRATOR.
About 130 in use. Write to
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MICHIGAN AMMONIA WORKS. - Detroit, Mich.

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EDWIN E. WITHERBY,
SPECIAL REPRESENTATIVE
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CLEVELAND, O.,
Will advise on commercial engineering subjects and operation of gas and electric properties.
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MUNICIPAL STATISTICS.
Information for New Business and Commercial and Municipal Ownership Campaigns. :: :: :: :: ::
CIVIC AND BUSINESS MEN'S ORGANIZATIONS PERFECTED.

WILLIAM A. BAEHR,
CONSULTING ENGINEER,

PEOPLES GAS BUILDING, CHICAGO.

Also Representing The Bartlett Hayward Company.

TENDERS FOR TAR.

Tenders are invited for the entire output of tar at the Vancouver and Victoria Gas Works for a period of one or two years, commencing August 4th, 1911.

Full particulars as to quantities available, loading facilities, etc., may be obtained on application to J. C. Moon, Manager, Vancouver Gas Company.

Sealed tenders, indorsed "Tenders for Tar," must reach this office not later than December 31st, 1910.

The highest or any tender not necessarily accepted.

(Signed), W. H. HAZLITT,
Purchasing Agent,
Vancouver Gas Co., Ltd.,

1848-4 VANCOUVER, B. C.

Position Wanted.

An experienced gas manager, now employed as manager, desires a similar position either with a natural or artificial gas company, in a city of 20,000 population or over. No preference as to location of city. Can leave present position on 30 days' notice. Results guaranteed.

Address, "A.,"
1843-tf Care this Journal.

Position Wanted.

Fifteen years' experience in the manufacture, distribution and construction of high and low pressure coal and water gas of various types. At present manager of a personally rebuilt plant (high pressure). **Worn-Out Western Plants** preferred. Salary first year, $1,380. If results are satisfactory, second salary, $2,000.

1846-4 Address, "MODERN," care this Journal.

WANTED,

Position as Manager and Superintendent of Gas Plant.

Best of references given. Fifteen years' experience in gas business. Address, "F.,"
1846-tf Care this Journal.

An Apprentice.

The undersigned, who is a graduate of the Technological College, and a finished chemist, of Toyo, Japan, desires to obtain an apprenticeship position in the manufacturing division of a gas plant located in or nearby Greater New York. Salary, no object; the desire to gain a practical knowledge of gas manufacture being the primary object,

Address, "H. K.,"
1847-2 Care this Journal.

Position Wanted.

Young man, 22 years old, with 5 years' experience in all lines of the gas business, especially office and complaint work, desires position with New England or New York gas company. At present chief ledger clerk in city of 80,000. Address, "ADAMS,"
1848-1 Care this Journal.

Position of Superintendent or Manager Wanted.

Qualifications as follows: Six years as engineer of gas and electric construction, two years as superintendent of manufacturing and distribution, two years estimating on property values—gas and electricity. Would prefer a gas and electric combination, but would accept either if of sufficient magnitude. Satisfactory references from present employers. Could report for duty within 15 days from date of acceptance. Address, "B. X.,"
1848-2 Care this Journal.

Position Wanted

As a Local or Supervising Manager of a Combination Gas and Electric Property or Properties, or of Independent Properties in Either Line.

Experienced in construction and operation; 35 years old; married; strictly sober, and not particular as to location.

Address, "UNIVERSAL,"
1848-2 Care this Journal.

WANTED,
METER REPAIRER.

Must be first-class man.

Address EL PASO GAS AND ELECTRIC CO.,
1846-5 EL PASO, TEX.

DESIRABLE POSITIONS.

WANTED--

Two first-class traveling salesmen to represent one of the largest leading manufacturers of trade mark gas ranges, water heaters and appliances.

One for Eastern, one for Western territory.

Must be thoroughly reliable and familiar with this line of work and have favorable acquaintance with gas men.

No others need apply.

Address, "BOX 292,"
1848-3 Care this Journal.

WANTED,

To buy good, second-hand purifying boxes.

PEOPLES GAS AND ELECTRIC CO.,
1846-4 BURLINGTON, IA.

FOR SALE AT ATTRACTIVE PRICES.

Blowers.—2 Connersville 68 ft. d.c. to Vertical Engines; 2 McKenzie, belt; 2 positive gas Sturtevant No. 10, belt, with 2 horizontal engines; 3 Roots No. 6 37 ft. d.c. to Vertical Engines.

Exhausters.—1 Connersville 58 ft., belt; 2 Connersville 33 ft. d.c. to Vertical Engines; 3 Wilbraham 55 ft., belt; 1 Roots 37.25 ft., direct; 2 McKenzie 25 ft., belt; 3 McKenzie 15 ft., belt; 1 McKenzie d.c. to Vertical Engine.

Engines.—1 Phœnix 11 in. by 14 in. Horizontal; two 6 in. by 6 in. Vertical; 1 Sturtevant, 4 in. by 6 in. Vertical, no wheels. (See Blowers and Exhausters.)

Flywheels.—2 C. I., 8 ft. 6 in. diameter, 26 in. face, 10-in. bore.

Station Meters.—One 9 ft. 6 in. by 9 ft. 6 in., no drum; one 9 ft. by 9 ft.; one 8 ft. 7½ in. by 8 ft.; one 8 ft. by 8 ft.

Purifiers.—4 boxes, 20 ft. by 24 ft. by 3 ft. 6 in., with 3 covers.

Tanks.—Of various capacities and shapes.

Flanged Fittings—Miscellaneous 16 in., 20 in. and 24 in.

For further particulars apply to
THE BROOKLYN UNION GAS COMPANY,
Kent avenue and Cross street, Brooklyn, N. Y.
1842-3m

FOR SALE,

One Set of "King's Treatise on Coal Gas."

Three volumes. Edition 1882. Price, $100.

Address,
AMERICAN GAS LIGHT JOURNAL,
42 PINE STREET, NEW YORK CITY.

STANDARD REDUCTION FACTORS for GASES, by Helon Brooks MacFarland, B.S., M.M.E. Price, $1.50. For Sale by American Gas Light Journal, 42 Pine Street, New York City.

FOR SALE.

Tenders will be received for the following second-hand benchwork, up to November 30th:

Arches, 7 feet 6 inches; retorts, 14 inches by 26 inches—McIlhenny lids; need grate and bearing bars. The equipment of about 20 free-firing benches of 6's; furnaces, 12 inches to 14 inches and 28 inches deep. Mains, etc., old style. Bridge pipes, with plugs, old style. The iron in these is in good condition. For particulars, address,

L. J. MONTGOMERY,
1836-tf 150 Nassau street, New York City.

FOR SALE.

Complete blowing outfit, suitable for 4-foot or smaller water gas set, consisting of one 15-horse power Harrisburg engine, one No. 5 Sturtevant blower, and all necessary belting and shafting. All in first-class condition. This machinery has been replaced with larger apparatus and will be sold cheap. Address,

SUNBURY GAS COMPANY,
1843-tf Sunbury, Pa.

The Light, Heat & Power Corporation, Boston
CONTRACTING ENGINEER
Electric Light and High Pressure Gas Plants. Equipment, Material and Supplies.
131 State Street, Boston, Mass.
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Manufacturers' Representative

—AND—

PURCHASING AGENT
FOR THE GAS TRADE.

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COX'S HIGH PRESSURE COMPUTER, 5.00

For Sale by American Gas Light Journal, 42 Pine St.

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GAS ENGINES,

With Instructions for Care and Working of the Same,

By G. LIECKFELD, C.E.

Translated with Permission of the Author,
By GEO. M. RICHMOND, M.E.

Price, $1.

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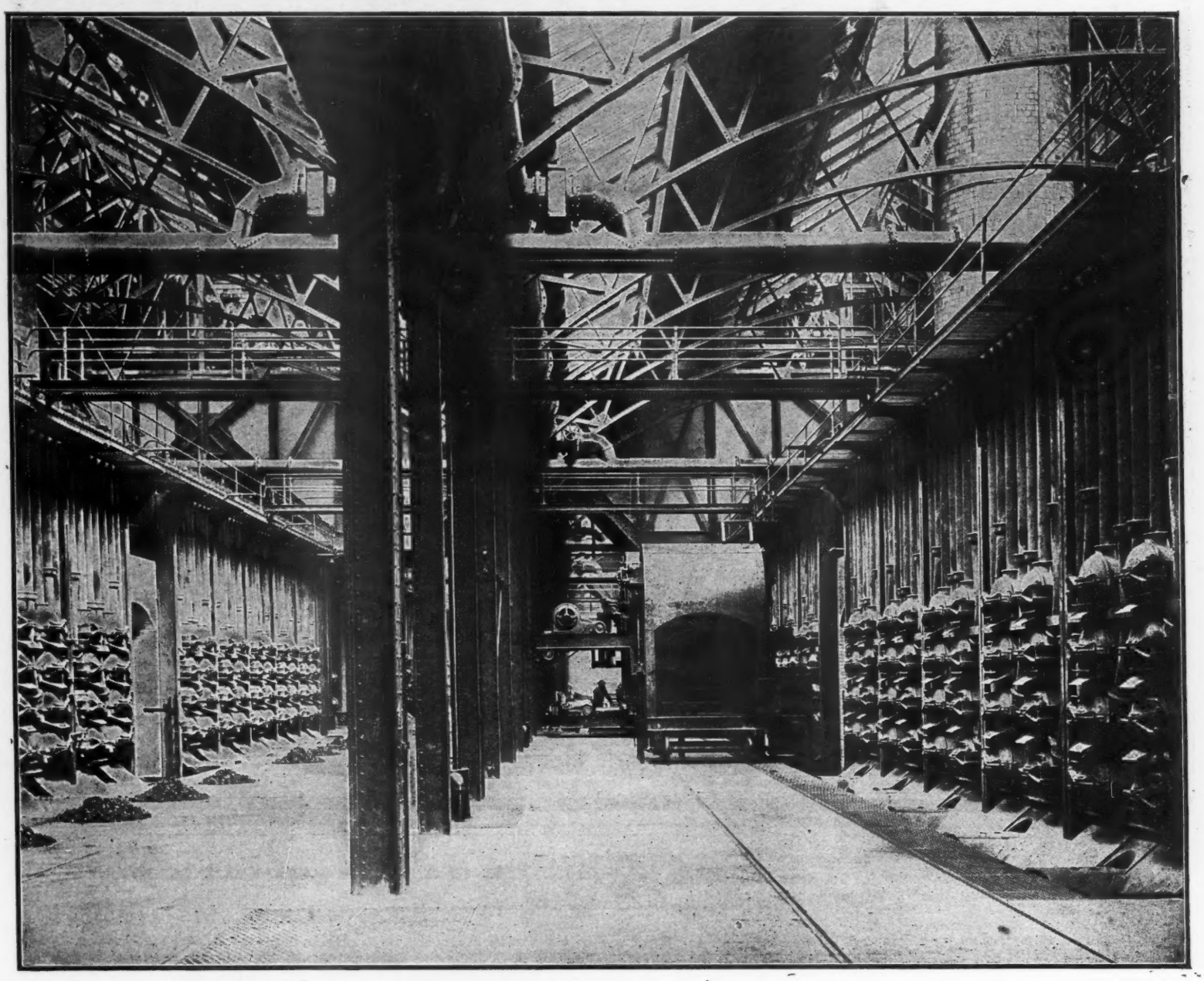
42 Pine St., New York City.



Eleven Millions Capacity in One Retort House.

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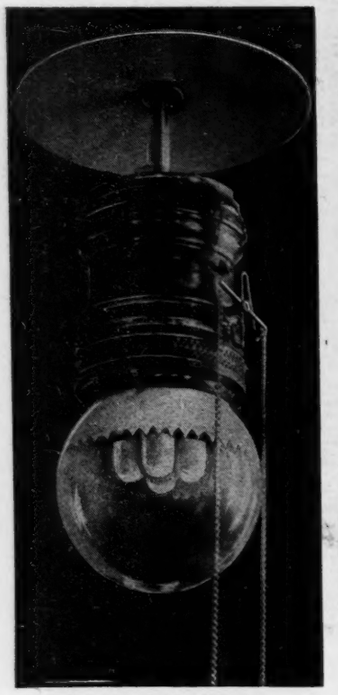
PITTSBURGH.

PLATE AND STRUCTURAL WORK OF EVERY DESCRIPTION.

COMPLETE COAL GAS PLANTS.



Made in 3 and 4 Burners.

AMERICAN 1910-A

INVERTED GAS ARC LAMP.

YOU WHO ARE LOOKING FOR GOOD THINGS NOTE SOME OF THE EXCEPTIONAL FEATURES OF THIS LAMP.

The Ventilator is made in two vertical hinged sections which may be easily opened, removed if desired, and locked automatically.

The Valve may be removed for cleaning by loosening ONE set screw and turning a hexagon nut. No Springs to get out of order.

All working parts accessible, removable and interchangeable, even while lamp is in operation.

Each Burner has a Separate Gas Adjustment which may be locked after correct incandescence is obtained.

Mantles are suspended in a Plate which raises and lowers on two guide rods—No Jar—No Warping—Great Saving in Maintenance Costs.

Porcelain Burner Noses are held firmly in position by German Silver Cap.

Best Material. Skilled Workmanship. Every Lamp guaranteed mechanically perfect.

A LABOR SAVER. A LIGHT GIVER. A PRICE SATISFIER.

CORRESPONDENCE SOLICITED.

AMERICAN GAS LIGHT COMPANY,

KALAMAZOO, MICH. BOSTON, MASS. MANCHESTER, ENGLAND.

MEETING TIMES OF THE VARIOUS GAS ASSOCIATIONS.

American Gas Institute.—Annual meeting, October, 1911. ————————. Officers: President, Donald McDonald, Louisville, Ky. Secretary, A. B. Beadle, 29 West 39th st., N. Y. City.

Canadian Gas Association.—Annual meeting, June, 1911. ————————. Officers: President, Arthur Hewitt, Toronto, Ont.; Secretary and Treasurer, John Keillor, Hamilton, Ont.

Empire State Gas and Electric Association.—Annual meeting, Nov., 1910. New York City. Officers: President, C. R. Huntley, Buffalo, N. Y.; Secretary, C. H. B. Chapin, 29 W. 39th street. New York City.

Guild of Gas Managers of New England.—Annual meeting, December. Young's Hotel, Boston; monthly meeting, second Saturday. Officers: President, A. K. Quinn; Newport, R. I.; Secretary, Walter G. Africa, Manchester, N. H.

Illinois Gas Association.—Annual meeting, time, March, Chicago, Ills. Officers: President, A. S. Harrington, Chicago, Ill.; Secretary-Treasurer, C. B. Strohn, Elgin, Ill.

Illuminating Engineering Society.—Annual meeting, Oct., —, 1911. Meetings of Sections, monthly. President, E. P. Hyde, Cleveland, O.; Secretary, Preston S. Millar, 29 W. 39th street, N. Y. City. Sections: New York: Secretary, Albert J. Marshall, 36 West 39th street. New England, Secretary, L. D. Gibbs 39 Boylston street, Boston, Mass. Philadelphia, Secretary, F. N. Morton, Broad and Arch streets Chicago, Secretary, F. H. Bernhard, Marquette Building.

Indiana Gas Association.—Annual meeting, January 19, 1911, Fort Wayne, Ind. Officers: President, Carl H. Graf, Indianapolis; Vice-President, S. E. Mulholland; Secretary-Treasurer, Philmer Eves, Indianapolis Gas Company, Indianapolis, Ind.

Iowa District Gas Association.—Annual meeting, time, June, 1911, ————————. Officers: President, Austin Burt, Waterloo, Ia.; Secretary and Treasurer, G. I. Vincent, Des Moines, Ia.

Kansas Gas, Water and Electric Light Association.—Annual meeting, time, ———— Wichita, Kas. Officers: President, W. A. Scothorn, Hutchinson, Kas.; Secretary and Treasurer, J. D. Nicholson, Newton, Kas.

Michigan Gas Association—Annual meeting, time, Sept. 1911; Battle Creek. Officers: President, A. P. Ewing, Detroit, Mich.; Secretary-Treasurer, Glenn R. Chamberlain, Grand Rapids, Mich.

Missouri Electric Light, Gas, Water Works and Street Railway Association.—Annual meeting, April 13, 14 and 15, 1911; St. Louis, Mo. Officers: President, R. J. Irvine; Secretary and Treasurer, W. J. Cunningham, Springfield, Mo.

National Commercial Gas Association.—Annual meeting, December 5-13, 1910. Boston. Officers: President, E. N. Wrightington, Boston; Secretary, Louis Stotz, 29 West 39th street, New York City.

Natural Gas Association.—Annual meeting, May 16, 17 and 18, 1911; Pittsburgh, Pa. Officers: President, John M. Garard, Columbus, O, Secretary, T. C. Jones, Delaware, O. Editor Wrinkle Department, F. W. Stone, Ashtabula, O.

New England Gas Association.—Annual meeting, third Wednesday in February; Boston. Officers: President, W. H. Snow, Holyoke, Mass.; Secretary-Treasurer, N. W. Gifford, East Boston, Mass.

Oklahoma Public Utilities Association.—Annual meeting, May 9, 10 and 11, 1911. Officers: President, E. C. Reynolds; Secretary, Galen Crow, Guthrie, Okla.

Pacific Coast Gas Association.—Annual meeting, Sept. 20, 21 and 22, 1911, Oakland, Cal. Officers: President, F. A. Leach, Jr., Oakland, Cal.; Vice-President, W. Baurhyte, Los Angeles, Cal.; Secretary-Treasurer, John A. Britton, 925 Franklin street, San Francisco, Cal.

Pennsylvania Gas Association.—Annual meeting, April, 1911, Reading, Pa. Officers President, J. H. Keppelman, Reading, Pa.; Secretary-Treasurer, William H. Merritt, Lebanon, Pa.

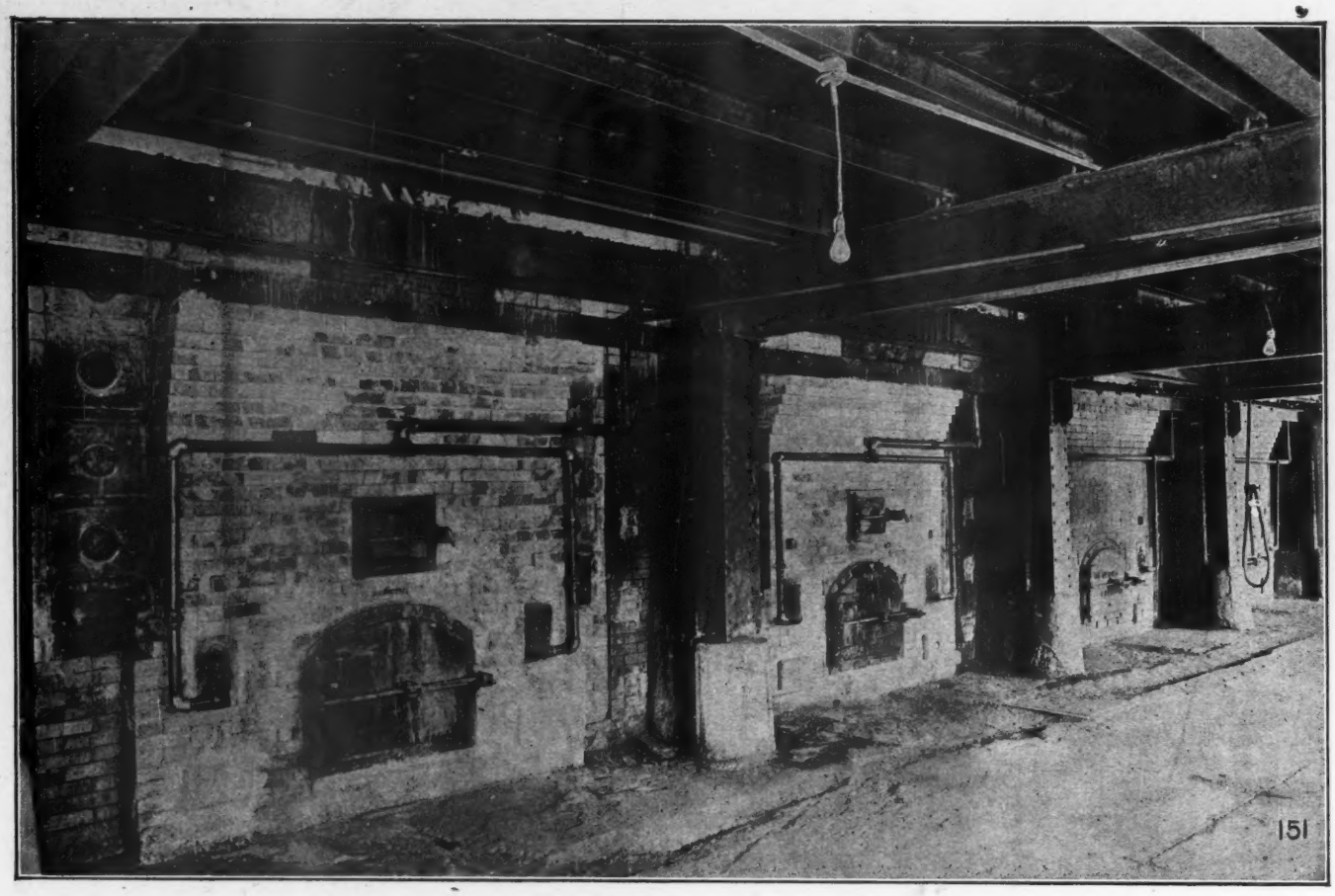
Society of Gas Lighting.—Annual meeting, December, 1910; monthly meeting, second Thursday. Place, New York City. Officers: President, Fred. S. Benson; Secretary, George G. Ramsdell, Waterbury, Conn.

Southern Gas Association.—Annual meeting, April 19-21, 1911, Montgomery, Ala. Officers: President, H. W. Frund, Salisbury, N. C.; Secretary-Treasurer, Jas. Ferrier, Rome, Ga.

Southwestern Electrical and Gas Association.—Annual meeting. May, 1911, ———— Tex. Officers: President, W. B. Tuttle, San Antonio, Tex.; Secretary, H. B. Head, Stephensville, Tex.

Wisconsin Gas Association.—Annual meeting, May ————, 1911, Milwaukee, Wis. Officers: President, W. H. Winslow, Superior, Wis.; Secretary-Treasurer, Henry Harmon, Milwaukee, Wis.

Directory of American Gas Companies, 1910. Price, $5.00. For Sale by American Gas Light Journal, 42 Pine St., N. Y. City.



An Installation of Doherty Economizer Benches at the Plant of the Indianapolis Gas Company.

PREVENTION IS BETTER THAN CURE.

You know the old saying, "An ounce of prevention is worth a pound of cure." It's as true about clinker as it is about measles.

The clinker once formed in a gas bench can of course be removed (**taking a part of your furnace lining with it each time**).

But the logical way is to **prevent the forming of the clinker**—and that is exactly what the Doherty Economizer does.

We do this by causing perfect combustion at a temperature below the "clinker point" of the ash—**and we do it without any sacrifice of combustion efficiency.**

More than this: **Freedom from clinker** means uniform heats, less expansion and contraction, greater gas producing capacity, longer life to the bench, lower labor cost.

The Doherty Economizer Bench is the only one on the market which is guaranteed to be free from clinker.

That fact alone would justify its adoption in every gas plant in the country. But there are other reasons, too.

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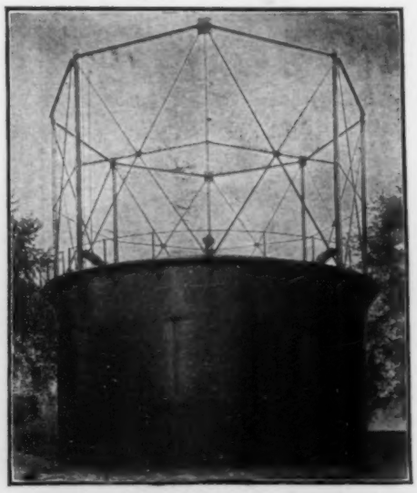

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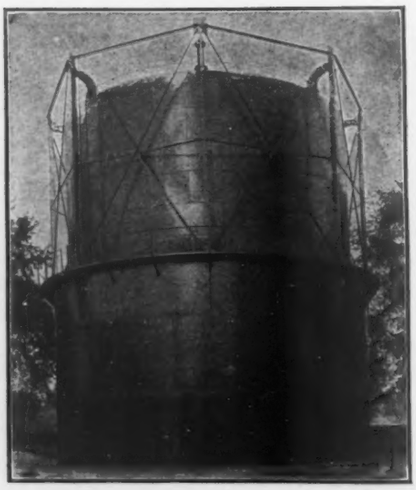

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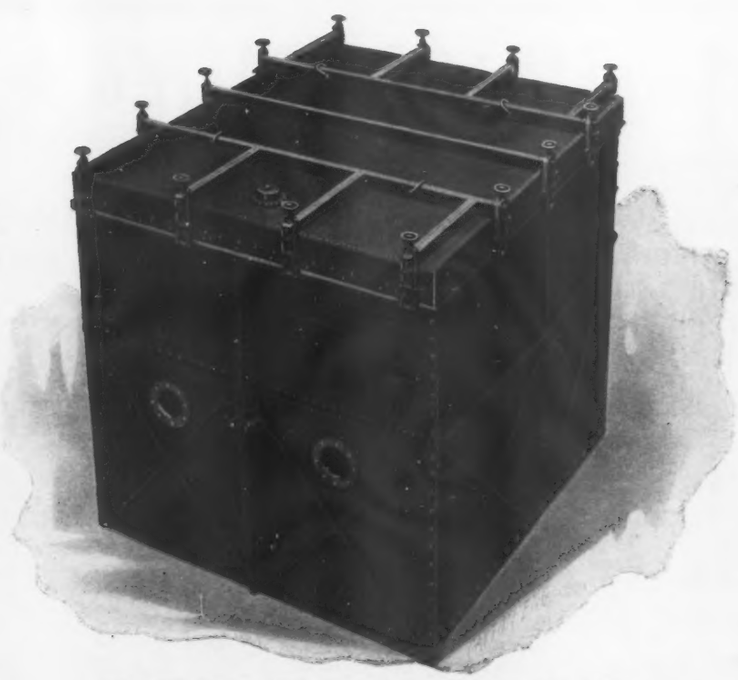

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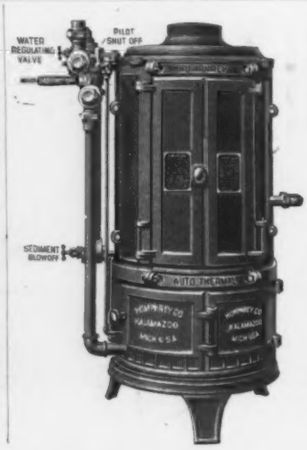

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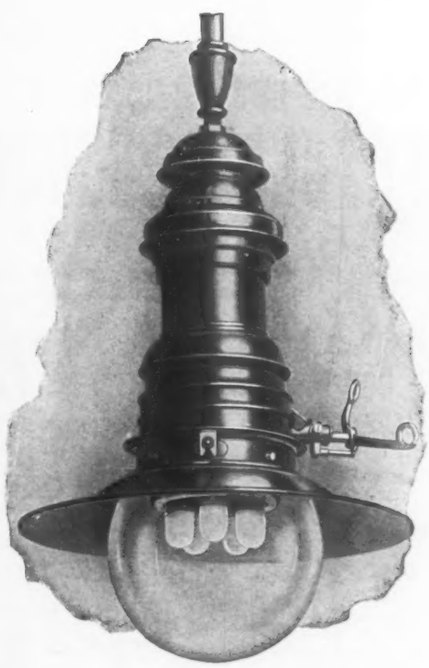

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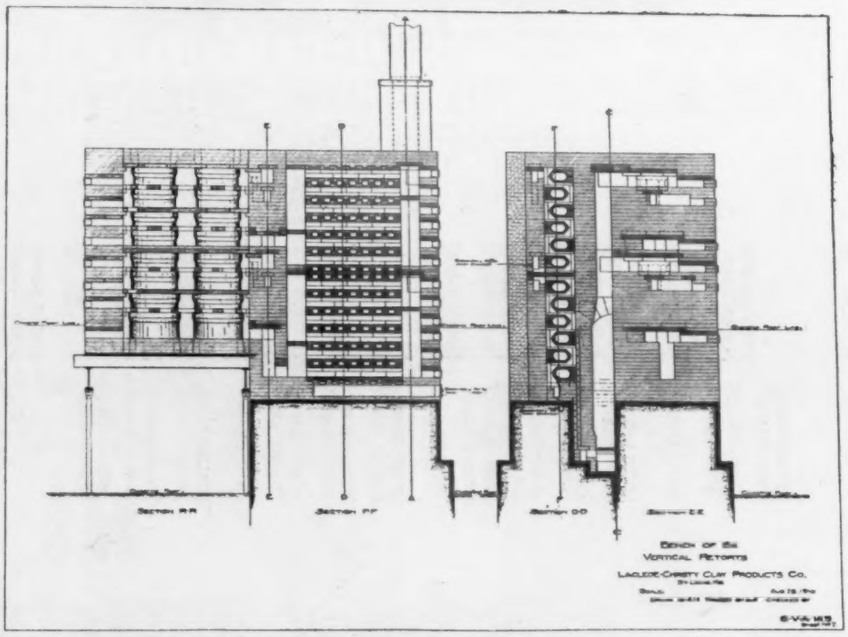

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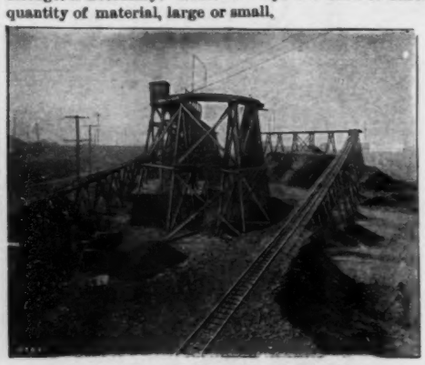

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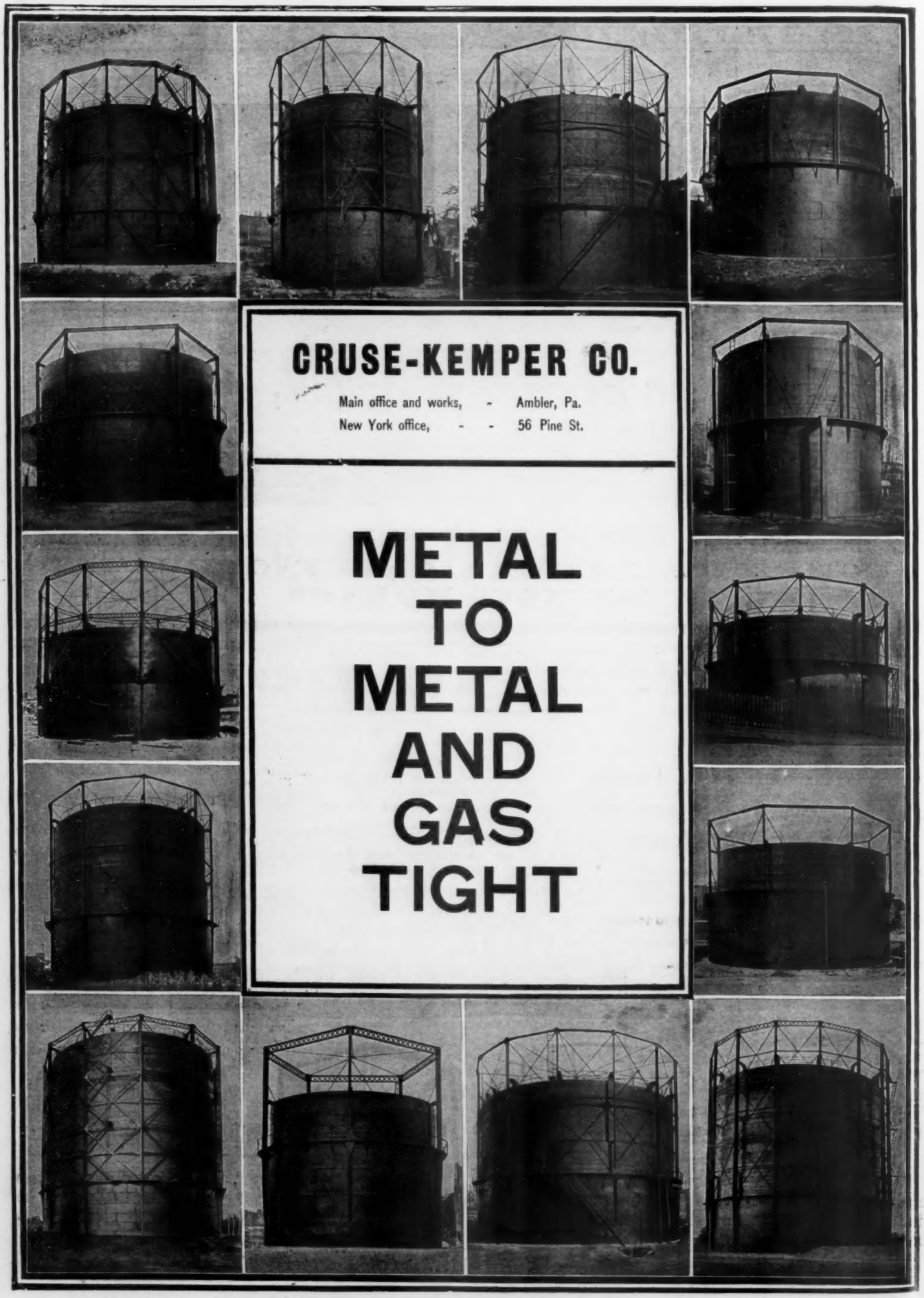
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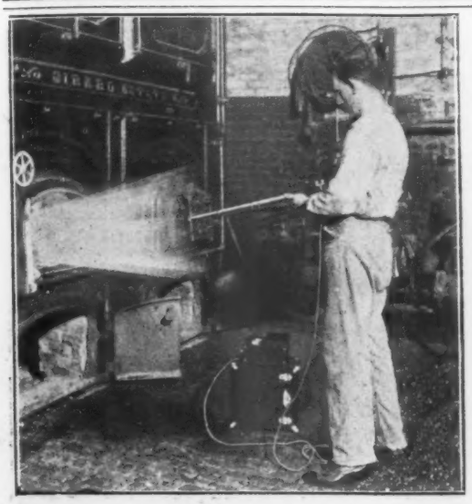

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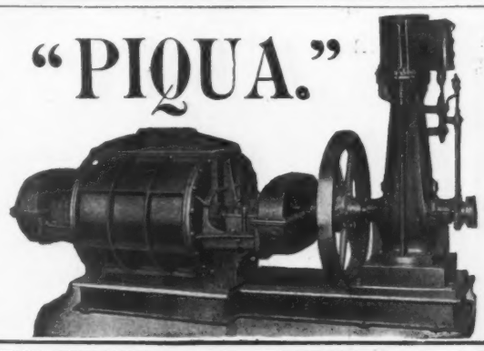

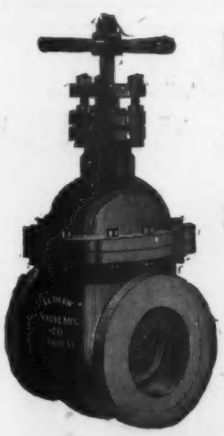

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		P.M.				P.M.	A.M.
Tue.	1	5.30 N.M.	5.30 A.M.	Tue.	1	4.37	5.17
Wed.	2	5.30	5.30	Wed.	2	4.37	5.17
Thu.	3	5.30	5.30	Thu.	3	4.37	5.17
Fri.	4	5.30	5.30	Fri.	4	4.37	5 17
Sat.	5	5.30	5.30	Sat.	5	4.27	5.27
Sun.	6	6.50	5.40	Sun.	6	4.27	5.27
Mon.	7	7.40	5.40	Mon.	7	4.27	5.27
Tue.	8	8.50	5.40	Tue.	8	4.27	5.27
Wed.	9	9.50 F.Q.	5.40	Wed.	9	4.27	5.27
Thu.	10	11.00 A.M.	5.40	Thu.	10	4.27	5.27
Fri.	11	12.10	5.40	Fri.	11	4.27	5.27
Sat.	12	1.20	5.40	Sat.	12	4.17	5.32
Sun.	13	2.30	5.40	Sun.	13	4.17	5.32
Mon.	14	3.50	5.40	Mon.	14	4.17	5.32
Tue.	15	No L.	No L.	Tue.	15	4.17	5.32
Wed.	16	No L.F.M.	No L.	Wed.	16	4.17	5.32
Thu.	17	No L.	No L.	Thu.	17	4.17	5.32
Fri.	18	5.10 P.M.	7.00 P.M.	Fri.	18	4.17	5.32
Sat.	19	5.10	8.00	Sat.	19	4.12	5.42
Sun.	20	5.10	9.10	Sun.	20	4.12	5.42
Mon.	21	5.10	10.20	Mon.	21	4.12	5.42
Tue.	22	5.10	11.30	Tue.	22	4.12	5.42
Wed.	23	5.10 L.Q.	12.40 A.M.	Wed.	23	4.12	5.42
Thu.	24	5.10	1.50	Thu.	24	4.12	5.42
Fri.	25	5.10	2.50	Fri.	25	4.12	5.42
Sat.	26	5.10	3.50	Sat.	26	4.07	5.52
Sun.	27	5.10	4.50	Sun.	27	4.07	5.52
Mon.	28	5.10	6.00	Mon.	28	4.07	5.52
Tue.	29	5.10	6.00	Tue.	29	4.07	5.52
Wed.	30	5.10	6.00	Wed.	30	4.07	5.52

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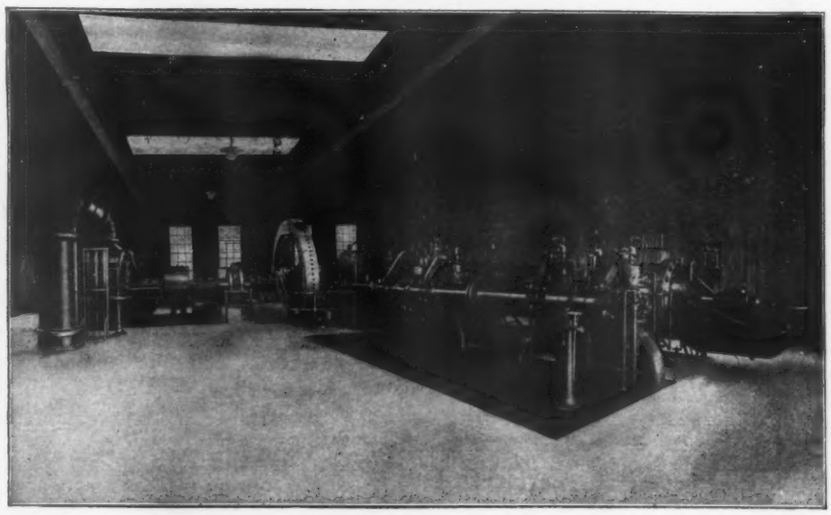

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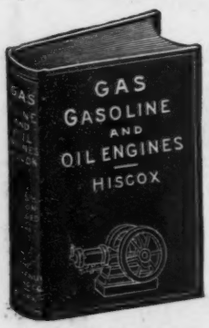

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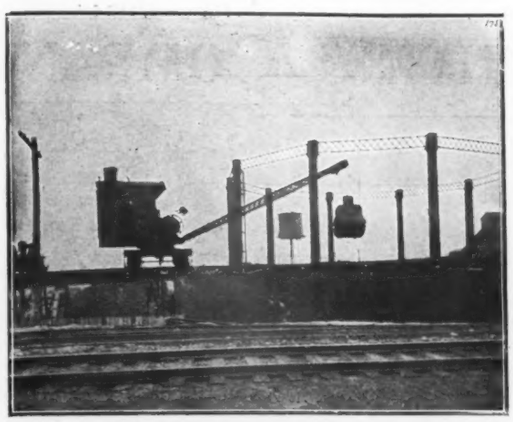

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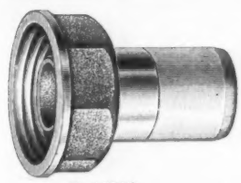

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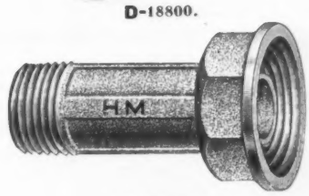

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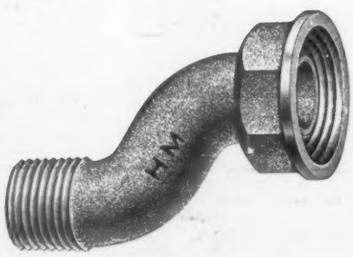

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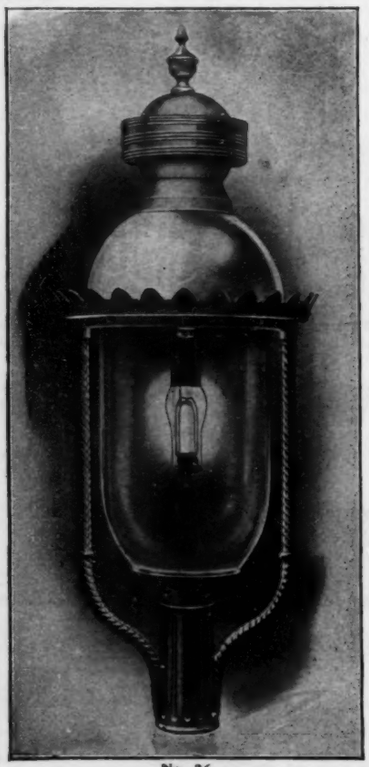

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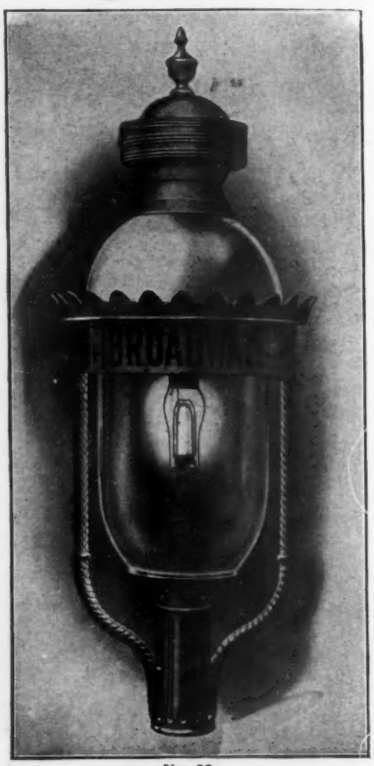

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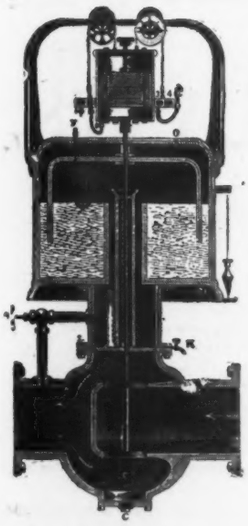

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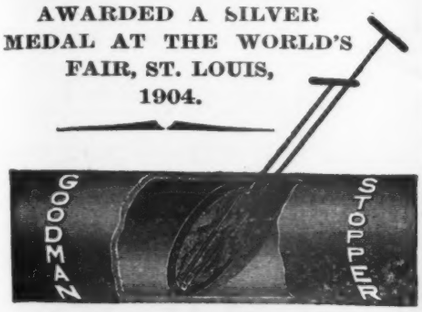

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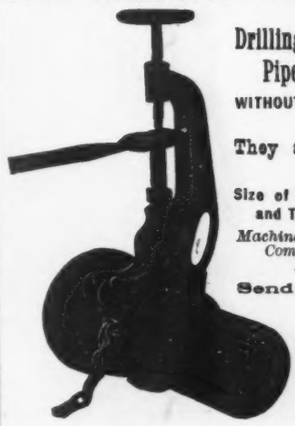

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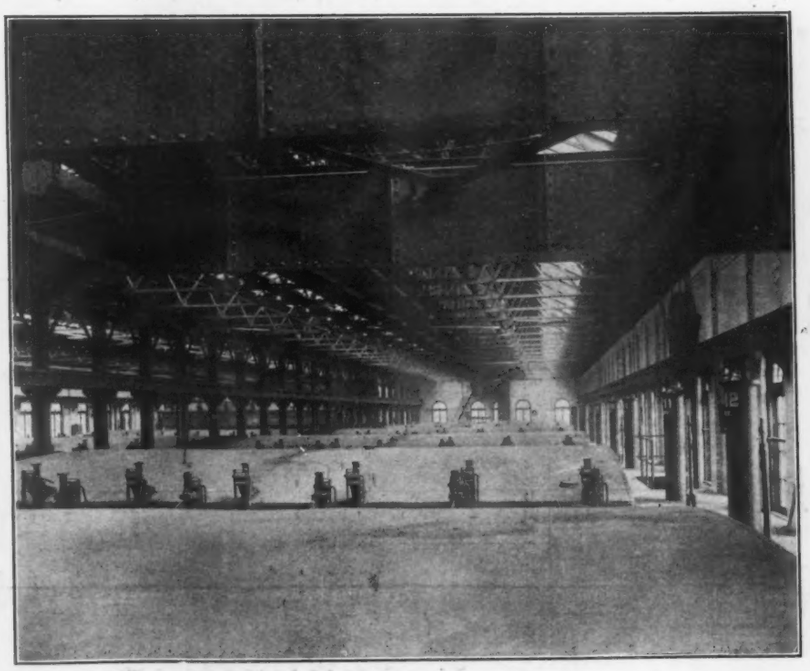

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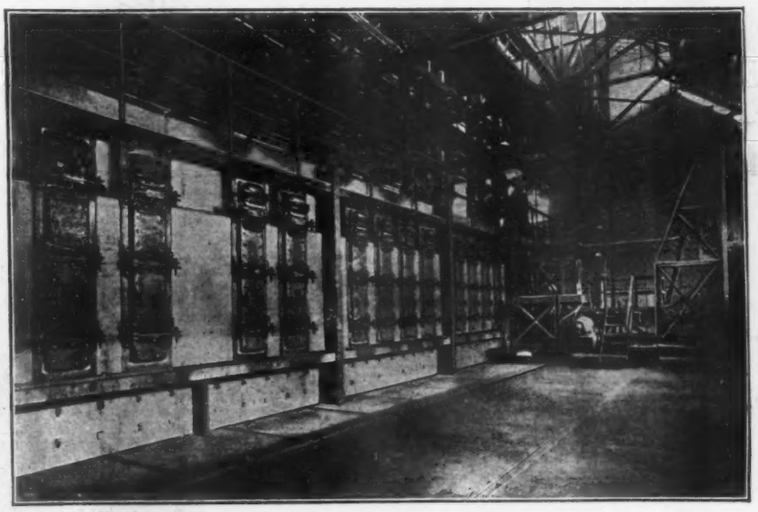

If Your Output is Over 250,000 ft. per Diem, Don't Fail to Consult us.

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The net results obtained from this process of carbonizing coal enables us to make this guarantee:

From a Ton of Coal we will Produce

More Gas — *Better Gas*
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With Less Labor than is Required by Any Other Process in Existence

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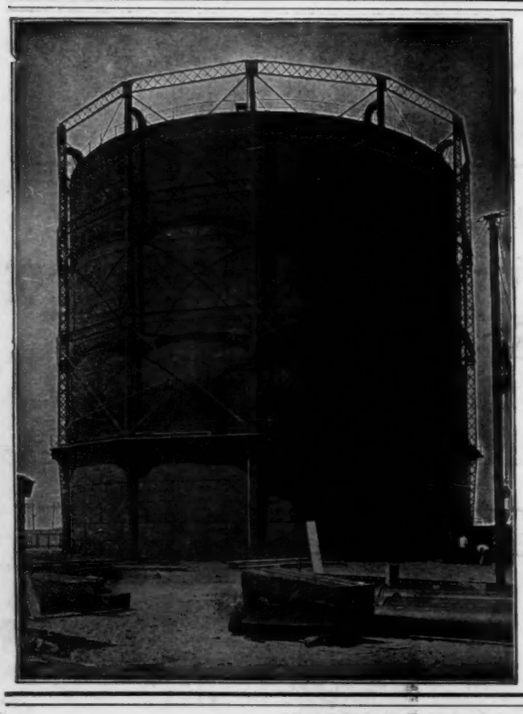

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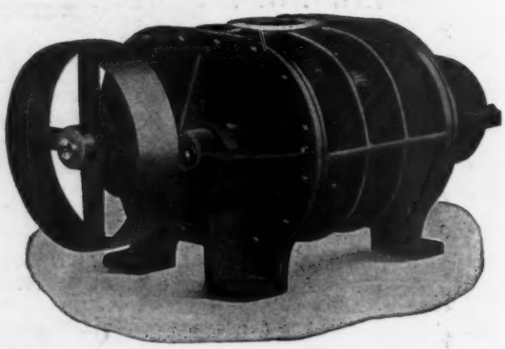

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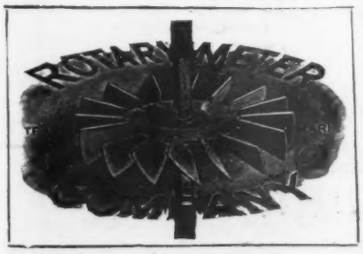

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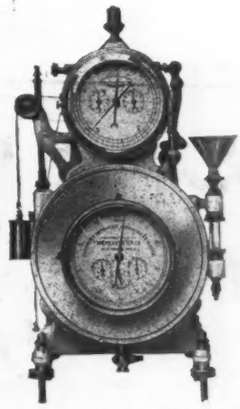

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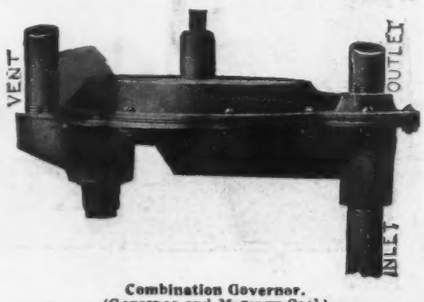

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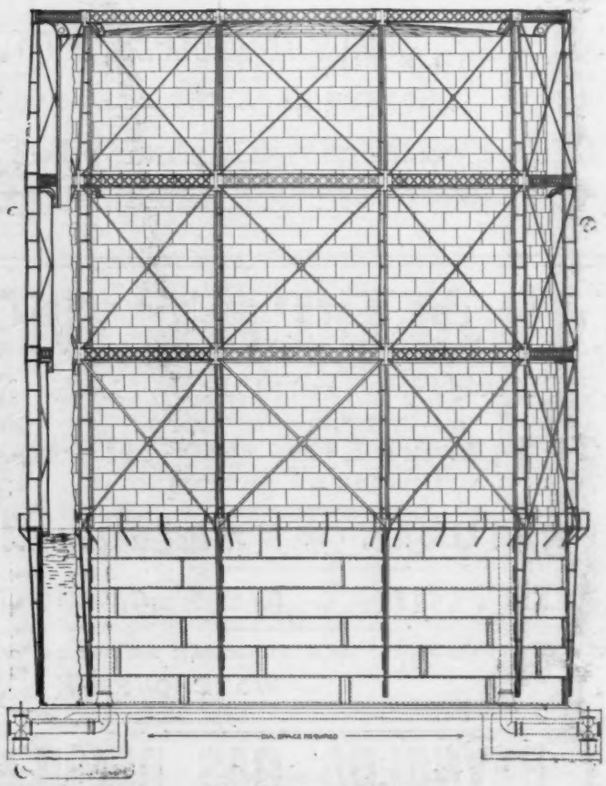

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